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Information Heterogeneity and Voter Uncertainty in Spatial Voting: The U.S. Presidential Elections, 1992-2004

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Information Heterogeneity and Voter Uncertainty in Spatial Voting: The U.S. Presidential Elections, 1992-2004

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Information Heterogeneity and Voter Uncertainty

in Spatial Voting: The U.S. Presidential Elections, 1992-2004

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This dissertation addresses voters' information heterogeneity and its effect on spatial voting. While most spatial voting models simply assume that voter uncertainty about candidate preferences is homogeneous across voters despite Downs' early use of uncertainty scale to classify the electorate, information studies have discovered that well and poorly informed citizens have sizeable and consistent differences in issue conceptualization, perception, political opinion and behavior. Built upon the spatial theory's early insights on uncertainty and the findings of information literature, this dissertation claims that information effects should be incorporated into the spatial voting model. By this incorporation, I seek

to unify the different scholarly traditions of the spatial theory of voting and the study of political information.

I hypothesize that uncertainty is not homogeneous, but varies with the level of information, which are approximated by political activism as well as information on candidate policy positions. To test this hypothesis, I employ heteroskedastic probit models that specify heterogeneity of voter uncertainty in probabilistic models of spatial voting. The models are applied to the U.S. presidential elections in 1992-2004. The empirical results of the analysis strongly support the expectation. They reveal that voter uncertainty is heterogeneous as a result of uneven distributions of information and political activism even when various voting cues are available.

This dissertation also discovers that this heterogeneity in voter uncertainty has a significant effect on electoral outcomes. It finds that the more uncertain a voter is about the candidates, the more likely he or she is to vote for the incumbent or a better-known candidate. This clearly reflects voters' risk-averse attitudes that reward the candidate with greater certainty, all other things held constant. Heterogeneity in voter uncertainty and its electoral consequences, therefore, have important implications for candidates' strategies. The findings suggest that the voter heterogeneity leads candidates' equilibrium strategies and campaign tactics to be inconsistent with those that spatial analysts have normally proposed.

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CHAPTER 1

Introduction

This dissertation addresses information heterogeneity across the electorate and its effect on spatial voting. Ever since Converse (1964) disclosed variations in the level of ideological constraints among the electorate, public opinion researchers have been interested in how voters with varying levels of political information make political decisions. They have discovered that the more informed and the less informed are different in perception of political agents, attitude toward policy issues, political preference and behavior. Because of this variation in individuals' decision making process, and the effect of that variation on political outcomes, public opinion scholars and democratic theorists have been pessimistic about the electoral choice made by the mass electorate, a large segment of which is uninformed about and inattentive to politics.

The spatial theory of voting, however, has shown no interest in information heterogeneity and its effect, even if information is a key element of spatial voting. An essential assumption of spatial voting is that voters make

decisions based on their preferences for candidates' positions on issues or ideology because voters have information on them. Particularly, deterministic voting models assume that voters vote unerringly for the candidate whose positions are closest to theirs. These models assume that voters have full, perfect information on candidates. Probabilistic spatial voting models, however, discard that stern assumption as a response to criticisms of its unreality. They acknowledge that voters have limited, incomplete information on candidates who they vote for, and admit that voters can and do err when choosing candidates. Despite their acceptance of limitations in the information that voters possess, however, spatial theorists have no interest in the fact that empirical researchers of public opinion have noted: some voters have more information than others and this uneven distribution of information has a crucial bearing on electoral outcomes. Empirical researchers have shown that more informed voters are more likely than less informed voters to conceptualize the issues they are concerned with on an ideological spectrum, and to perceive candidates as being at ideologically aligned positions with smaller variations. This dissertation presumes

that these differences in their conceptualization and perception of candidates make voters heterogeneous in uncertainty about their choices. Some voters are more certain about their preferences than others, and thus make smaller errors in their vote choices. This supposition is a significant challenge to the basic assumption of the spatial theory of voting.

Uncertainty expressed as the error term is a key element of probabilistic spatial voting models. The error term, or uncertainty, indicates "some positive probability for choosing a candidate who is not closest to the voter in the predictive space (Lin et al 1999: 60)." With probabilistic spatial voting, uncertainty is inherent in any election by the mass electorate because of the noisy information process, because of candidate-induced ambiguity or because of the difficulty of predicting candidates' future policies (Enelow and Hinich 1984). However, the degree of uncertainty is assumed to be homogeneous across voters; which, I believe, is unrealistic. As long as voters differ in their abilities to acquire and process (costly) information, to perceive the ambiguous positions that

candidates strategically present and to predict candidates' real policy changes, then uncertainty should vary with those differing abilities.

It is surprising that the spatial theory of voting is indifferent to information heterogeneity and its effects because heterogeneous uncertainty is an important issue of the seminal work by Downs (1957), who first introduced the spatial theory of voting to political scientists. Downs classified voters and nonvoters according to their levels of uncertainty and political activism, and argued that the influences of uncertain and certain voters on governmental decision-making differ. This suggests that heterogeneous uncertainty plays an important role in the fledging spatial theory of voting. However, spatial analysts after Downs have been unconcerned with information heterogeneity. They simply assume that uncertainty, or the error term of the spatial voting model, is a random variable that is normally distributed.

Since the Michigan School scholars revealed that the levels of information and issue conceptualization vary across individuals, the topic of uneven distribution of information has been dominated by empirical researchers who

study elections from behavioral perspectives. This behavioral tradition usually presumes that vote choice is swayed by various other motivations than policy issues (Erikson and Romero 1990) and this may alienate the spatial analysts from the scholarly interest in unevenness of information and its effects, which are still a topic of lively interest among behavioral researchers. For spatial analysts, the issue-oriented electorate is inherently given and voting motivations other than issues are considered the disturbances of voter decision making. Given that all voters are policy-oriented, non-policy considerations or errors are considered only a noise which is an innate characteristic of campaign information. As a matter of fact, differently from the scholars of information studies, most spatial analysts are quite optimistic about the mass electorate's abilities. They tend to agree that individuals can have informed preferences due to various information cues.

This dissertation stands along the same line as empirical researchers who assert that the information cue explanation lacks compelling empirical evidence to explain the observed divergences between more and less informed people with respect to political perceptions, attitudes and behaviors. By incorporating

information effects into the probabilistic model of spatial voting, I seek to unify the different scholarly traditions of the spatial theory of voting and the study of political information. Based on empirical evidence of information heterogeneity, I challenge the spatial voting model's conventional assumption that voter uncertainty is randomly distributed. This challenge is actually a resumption of Downs' argument of voter heterogeneity on the uncertainty scale. I hypothesize that uncertainty is not homogeneous, but varies with the levels of information, which are approximated by political activism as well as information on candidate policy positions. To test this hypothesis, I employ heteroskedastic probit models that specify information heterogeneity in probabilistic models of spatial voting.

The models are applied to the U.S. presidential elections in 1992-2004. The empirical results of this study imply that heterogeneity in voter uncertainty caused by uneven distributions of information and political activism is observed even when voting cues other than issue proximity are available. This heterogeneity in voter uncertainty has significant effects on electoral outcomes. Having a characteristic of risk aversion, American voters are expected to discount

candidates with a certain level of uncertainty. Heterogeneity in voter uncertainty and its electoral consequences, therefore, have important implications for candidates' strategies. The results suggest that the voter heterogeneity leads candidates' or parties' equilibrium strategies and campaign tactics to be inconsistent with what spatial analysts have normally proposed.

In sum, this dissertation contributes to scholarly interests of both spatial voting and information studies particularly by unifying those different scholarly traditions. It proposes a spatial theoretical approach to vote choice, which is modified on a basis that is more realistic than the conventional spatial voting models show. This revision suggests adjusted equilibrium strategies. In addition, it also implies an important way that information affects electoral outcomes, which even empirical researchers have ignored: through its effect on voter uncertainty. This study, therefore, arouses the study of political information to notice this important element of voter heterogeneity – heterogeneity in uncertainty about candidate preferences – that results in disparities in voters' choices. The systematic disparities among voters in voting behavior caused by heterogeneous

uncertainty are enough to deserve more attention form both rational politicians and researchers of voting behavior.

Chapter 2 discusses existing literature which motivates the theoretical framework of this study. I first define the concept of uncertainty in the framework of spatial analysis and discuss why spatial analysts consider uncertainty to be homogeneous across individuals. I notice that this assumption of homogeneity is supported by the psychologists who assert that heuristic devices can compensate for a lack of information. I trace the debate on information effects by contrasting this approach and the information literature, and discuss the reason for specifying information effects in spatial voting models. I also look at some spatial theorists whose findings propose the significant effect of voter heterogeneity on spatial voting. Finally, to examine the electoral consequences of uncertainty, I discuss theoretical and the empirical findings inferring the voters' risk-averse attitudes that reward the candidate whose positions are relatively certain.

Chapter 3 discusses this study's methodological approaches. I argue that the standard probit model for voting choice, which assumes equal variance across

observations, may yield inconsistent maximum likelihood estimators; and thus probit models should specify heteroskedasticity. As an alternative to standard probit estimations, I propose a heteroskedastic probit model whose error variance is specified by information and political activism. This chapter discusses the measurement of spatial proximity for this model's choice equation, and the measurement of information and activism for the variance equation.

Chapters 4 and 5 explore heterogeneity in voter uncertainty in the 1992-2004 U.S. presidential elections. As the preliminary analysis for the heteroskedastic probit analysis, Chapter 4 examines how differently the more and less informed, and the more and less active, conceptualize issues and place candidates' positions. This chapter is fundamentally concerned with how this discrepancy leads voters to be diverse in their uncertainty about vote choices, which is measured here by simple calculations of voting "correctness."

Chapter 5 contains the results of the heteroskedastic probit analysis. Here I present several sets of heteroskedastic probit models to explore whether information cues eliminate either heterogeneity in uncertainty, or the effects of

information and activism on uncertainty. Given the results, I examine the determinants of voter uncertainty to see which factors make some individuals less certain than others.

Chapter 6 turns to the question of how heterogeneity in voter uncertainty affects electoral outcomes. To explore disparities among voters in vote choice, this chapter adopts not only a straightforward statistical analysis but also the theoretical formulation where the effect of uncertainty on vote choice in the heteroskedastic probit model is estimated in a very direct and simplified way. Both the empirical and theoretical analyses focus on whom the voters are more likely to vote for, as they become uncertain.

In Chapter 7, I summarize the empirical findings of this dissertation and reach a conclusion about the effect of information heterogeneity on voter uncertainty and its implications. Finally, this dissertation concludes by suggesting future avenues for research.

CHAPTER 2

Information Heterogeneity and Uncertainty in Elections

2.1 Uncertainty and the Homogeneity Assumption

2.1.1 Uncertainty about Candidate Positions

As the traditional spatial model of voting assumes that an individual votes for the candidate whose issue positions are closest to his/her own positions, it normally posits that individuals know candidate positions on issues with certainty. However, scholars of public opinion have discovered that there is a significant degree of uncertainty in the electorate about candidate positions on policy issues. Some empirically-oriented scholars even argue that issue proximity may be less important than uncertainty about candidate position in electoral choices (Bartels 1986). While a massive amount of information about the candidates is available during campaign periods, incomplete and imperfect presentation of this information is inherent to the nature of campaigns. As Downs (1957: 83) mentions, persuaders or information sources “provide only those facts which are

favorable to whatever group they are supporting." They generally provide information on non-policy issues such as candidate characteristics, and as a consequence, ordinary citizens are uncertain about where a candidate is located on the policy dimension.

Enelow and Hinich (1984-a) classify uncertainty into three distinctive types: First, uncertainty can be induced by the candidates who change their positions from one election period to the next (candidate-induced uncertainty). In many circumstances, candidates strategically present ambiguous policy stands during election periods (Shepsle 1972) and move on the policy dimension between election periods. Candidate-induced uncertainty is assumed to leads voters to decide their votes by estimating the probability that candidates will change their positions.

Second, uncertainty may be the result of disincentives and the inability of voters to acquire and process costly information (perceptual uncertainty). As Enelow and Hinich point out, "voters typically lack incentives to resolve uncertainties they have about the candidates" (1984-a: 115), given that

information is costly to acquire. In addition, because the media tend to provide information about non-policy characteristics of the candidate rather than information about the candidate's policy positions, campaign information is "inherently imperfect" (1984-a: 122). As a result, voters tend to rely more on non-policy characteristics than on policy-oriented information and a distortion or noise results while candidates' true positions are transmitting to the voters. This distortion is considered a random element rather than a single point.

Finally, uncertainty about candidate positions may be caused by the difficulty of prediction about real policy change if a candidate is elected to office (predictive uncertainty). Because prediction of future events is difficult to be precise, this type of prediction is also characterized by a probability density around a set of points rather than by a point.

While these types of voter uncertainty appear quite distinct, for example, the first is exogenous and the second and third are endogenous (Alvarez 2001: 30), in practice they are difficult to distinguish. As Alvarez states, perceptual uncertainty comes both from "candidates' incentives to disseminate ambiguous

information" as well as voters' disincentives of processing costly information. In addition, because predicting future policies can only be based on ascertaining the current positions of the candidates, predictive uncertainty is linked to the uncertainty caused from the first two types. As this study focuses on information shortcomings in the electorate, in other words, "endogenously driven uncertainty in voters' minds (Alvarez 2001:30)," it basically employs the concept of perceptual uncertainty rooted in a noisy information process, but to be complete must encompass all three types of uncertainty.

Under these uncertainties, voters' perceived position of candidate A is a random variable, $\tilde{\omega}_A = \omega_A + \varepsilon_A$, where ω_A is candidate A's true position and ε_A is the error resulting from the voter's uncertainty about the candidate position.

In the probabilistic spatial model, uncertainty about candidate positions is commonly expressed as the error term of the utility function that each voter uses when evaluating the candidates. Let U_{jm} represent voter *m*'s utility for candidate *j*. Voter *m*'s utility for candidate *j* is typically specified as the sum of spatial

proximity and a random variable representing voter *m*'s uncertainty about candidate *j*:

$$U_{jm} = \beta \left\| \pi_j - z_m \right\|_A^s + \varepsilon_{jm}$$

where π_j denotes the coordinates of the j^{th} politician on a *k*-dimensional policy space; z_m denotes the ideal point of the m^{th} respondent in the space; $\left\| \pi_j - z_m \right\|_A^s$ denotes a measure of distance between π_j and z_m; and ε_{jm}, is a random variable representing voter *m*'s uncertainty about candidate *j*, which is assumed to follow a normal distribution with zero mean and homoskedastic variance. The smaller the variances of this distribution, the less uncertainty the voter has about the candidate[1].

In an election with two candidates, *j*=0, 1, voter *m* is assumed to vote for candidate 1 if and only if her utility for candidate 1 exceeds her utility for candidate 0:

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[1] As discussed above, this uncertainty may arise mainly from a voter's inability of establishing the candidate's positions. The utility function, however, does not leave out the possibility that the error interpreted as uncertainty results from the voter's non-policy considerations for the candidate instead of considering the issue positions of the candidate (Lin et al. 1999).

$$U_{1m} - U_{0m} = \beta(\|\pi_1 - z_m\|^s - \|\pi_0 - z_m\|^s) - \varepsilon_m > 0$$

where $\varepsilon_m \equiv \varepsilon_{0m} - \varepsilon_{1m} \sim N(0, \sigma^2)$, representing voter *m*'s uncertainty concerning candidate preference. Again, a smaller variance of this corresponds to a lower level of voter *m*'s uncertainty.

2.1.2 Homogeneity Assumption of Uncertainty

When using the hypothesis of the randomness of perceived candidate positions, a crucial assumption of the spatial model of voting is that the error term, uncertainty, is homogeneous in its degree across individuals. In fact, though probabilistic spatial voting models contain an element of uncertainty that allows "some positive probability for choosing a candidate who is not closest to the voter in the predictive space (Lin et al. 1999: 60)," most ignore heterogeneity in information and uncertainty. Some studies have addressed imperfect or limited information but only have justified spatial-theoretical assumption about voters' capabilities to draw accurate maps of politics even with little information. They often insist that uncertainty is an obvious characteristic of issue voting because of

imperfect nature of campaign information, but that it is not a significant problem because uninformed voters can infer more informed preferences by using information shortcuts to compensate for their lack of information.

According to McKelvey and Ordeshook(1986), equilibrium is assumed to extract enough information about candidate locations to make a correct decision at candidate midpoint, due to sources such as interest group endorsements and other voters' preferences observed in poll results. Uninformed voters can vote rationally by voting according to sources they assume are informed and rational. According to McKelvey and Ordeshook, these "cues can provide more than approximations (McKelvey and Ordeshook 1986: 934)." As a consequence, candidate positions in equilibrium reflect the preferences of both the informed and the uninformed. Similarly, Grofman and Norrander (1990) argue that, in a one-dimensional two-candidate competition, because voters can use group endorsements as information cues, they do not need to know anything directly about candidate positions on issues. Assuming that each voter can have knowledge of the relative proximity of reference groups to the voter (225), they

propose that the best choice for the voter is the choice suggested by the group that is closet to his own preferences.

Hinich and Munger (1994) claim that ideology, rather than polls and endorsements, is the basis for uncertain political choice in a large, mass electorate. Voters use ideology as a reduced policy dimension in such a way that they abstractly predict a candidate's position when the actual issues are unknown. (100). According to Hinich and Munger, because ideologies within the political sphere are typically reduced to binaries (144), and an ideology offers a shared perception of a good society, selecting between one of two ideologies may give uninformed citizens an information advantage when choosing candidates. Hence, the informed and uninformed do not necessarily have different shapes of distributions of candidate positions.

The information shortcut explanation was introduced into spatial theory from the ideas of political psychology. Political psychologists suggest that ordinary people are capable of inferring informed preferences, due to their ability to make reasonable decisions with minimal cognitive effort by employing

information shortcuts or heuristics. However, various studies have shown that the information shortcut explanation is questionable.

The following section addresses literature that considers political conceptualization, information or sophistication. Then in Section 2.3, I discuss literature concerning the information shortcut explanation specifically. Both sections suggest that assuming the homogeneity of voters' uncertainty has not obtained theoretical or empirical validity, and provide strong arguments in favor of specifying information effects in spatial models of voting. Section 2.4 addresses the literature of spatial voting that suggests the possibility of unifying different scholarly traditions into one model comprising heterogeneity in voter uncertainty. Then, Section 2.5 turns to the question of how heterogeneous uncertainty affects voting decisions. As a significant disagreement about the electoral consequences of uncertainty exists in the study of spatial voting, this dissertation attempts to explore whether and how uncertainty – heterogeneous uncertainty – matters. Finally, in Section 2.6, I establish my hypotheses and demonstrate my expectations based on the literature.

2.2 The Effect of Political Information and Conceptualization

Since the early Michigan School scholars suggested that a great deal of the public have no opinions about political issues, public opinion researchers have learned that political information varies across individual voters, having significant effects on political attitudes and behavior.

The authors of The American Voters (1960), Campbell et al., discuss the concept of ideological conceptualization and reveal that large proportions of the American public in 1956 displayed low levels of conceptualization. According to their classification of conceptualization, around one half of Americans were classified either as making simplistic connection between goodness and badness or having perceptions of candidates not based around policies, and only around 11.5 percent of the electorate showed ideological interpretation in their political attitudes (222-23).

In his seminal article, “The Nature of Belief Systems in Mass Publics,” Converse (1964) asserts that large segments of the electorate show low levels of ideological conceptualization, and thus, lack ideological constraint, which is central in a belief system that implies consistency between idea elements in an ideology. From his findings that show minimal attitudinal consistency between issue items as well as little stability over time, he concludes that “the individual lacks the contextual grasp to understand that the specific case and the general principle belong in the same belief system (Converse 1964: 230).” According to Converse, because only politically knowledgeable people pay enough attention to elite discourse, the source of mass ideologies, attitude constraint develops mainly among the more politically sophisticated, those that are better educated and already more politically involved.

Even if changes have taken place since Converse, empirical evidence has shown that the mass public still has lower levels of conceptualization than the politically sophisticated. Nie et al. (1976) find that, despite a significant change toward a higher level of conceptualization from 1952 to 1976, there still existed

cognitive limitations among the public and that numbers of politically sophisticated people did not increase significantly. According to Delli Carpini and Keeter (1991), who compare the level of political knowledge in 1989 with those in 1940s and 1950s, levels of political knowledge even declined significantly. Other scholars reveal that there is a distribution of sophistication levels in the electorate (Delli Carpini and Keeter 1996; Jacoby 1986, 1991, and 1995). Jacoby discovers that the higher one's political sophistication, the more heavily one relies on the liberal-conservative dimension. Similarly, Delli Carpini and Keeter (1996), Alvarez (2001) and others show that political information promotes "consistency between voters' opinions and their votes" (Delli Carpini and Keeter 1996: 255). Further, scholars find that higher levels of political sophistication lead to more systematic structures of perceiving candidates. An agreement is that less sophisticated (or informed) people tend to place candidates at the midpoints of issue scales while more sophisticated people tend to perceive candidates at more ideologically extreme positions (Alvrez and Franklin 1994; Glasgow 1999; Judd and Lusk, 1984; Linville, 1982; Linville and Jones, 1980; Sniderman et al. 1991;

Tesser and Leone, 1977; Zaller, 1992).

While scholars of political conceptualization and sophistication were challenged on methodological grounds,[2] many studies with methodological improvements have persisted that more valid and reliable measures of conceptualization support the findings of conceptualization literature: different levels of integration in the public's belief system and varying ability in linking abstract principles to specific applications (Cassel 1984; Hagner and Pierce 1982; Wyckoff 1987).

All these studies agree that voters have heterogeneous but as a whole substantially low levels of information and conceptualization. More recently, empirical researchers have begun to find sizable and consistent differences in political opinion and behavior between well and poorly informed citizens.

Zaller (1992) finds that the opinions of more politically aware people are subject to greater constraint than those less aware. According to his model consisting of several axioms, more aware people have higher levels of cognitive

[2] See Smith (1980).

engagement with political messages from elite discourse and are more likely to resist information inconsistent with their values and accept information consistent with them. Revealing the lack of political information in the American electorate, Delli Carprini and Keeter (1996) show substantial and often dramatic differences between highly and poorly informed people lead to different levels of political virtues, interests, political activities as well as stability and consistency of political opinions. They conclude that a lack of information in the electorate has a critical consequence in that misperception of what the government and candidates do and do not sharply curtail the public's rationality of choices. More recently, Bartle (2000) insists that the constrained and stable opinions of most voters are systematically associated with measurement error and that different levels of political knowledge among the British electorate yield considerable heterogeneity in constraint and temporal stability of ideological positions and opinions. Consequently, he warns that we should be cautious to apply issue-voting model to people with low levels of awareness (481).

Several studies attempt to formally test the hypothesis that uninformed voters successfully use cues and information shortcuts to behave as if they were fully informed. Bartels (1996) estimates that hypothetical full information would have shifted votes up to almost five percentage points. Althaus (1998)'s simulation with the 1988 and 1992 American National Election Studies data also presents that correcting for information asymmetries produces different collective preferences from actual ones.[3] From a series of deliberative polling designed to determine the effect of political deliberation, Fishkin, Luskin and their colleagues (1998, 1999, 2000, and 2002) have discovered that more political information and thought about issues can induce a significant shift in political attitudes and outcomes. These findings strongly support the claim that information heterogeneity exists across the electorate and this uneven distribution of political information in the electorate may produce distorted political outcomes.

[3] In a working paper, Luskin and Globetti (1997) also estimate the effect of full information in the 1988 presidential election up to almost four percentage points. Their finding suggests that Bush would have lost in 1988, if the electorate were fully informed.

2.3 Decisions Made with Limited Information

While public opinion researchers have found empirical evidence on information disparity among voters and its critical impact on political outcomes, this pessimistic view of the public's abilities has been challenged by the literature that asserts rationality of public opinion. This line of studies suggest that ordinary people can form opinions consist with their political predispositions despite little information, because they can use various information cues, so-called, heuristics. People can successfully infer their own policy preferences from their liked or disliked figures, prior information about candidates, partisan cues, group endorsement, ideology, incumbency, retrospective evaluations of the economy and others.

Among these various information sources, the most prevalent, probably the most important, information cue for vote decision among the American public is individual's partisanship – the affiliation with a party and its strength. The psychological affective attachment to a party is a core value that shapes proximate attitudes toward candidates, parties or policies in America. Most voters who

identify with one of the two major parties can have their perceptions of parties, candidates, and policies based on their partisan orientation. Many scholars have agreed to Compbell et al.'s claim that party identification raises a perpetual screen (Campbell et al. 1960) that filters new information and colors individuals' political attitudes. Jacoby finds that an individual's issue positions are "a function of perceptions of his/her party's stands (1988: 643)" on those issues. Zaller (1992) also proposes that partisan considerations lead people to resist accepting new information that does not conform to their partisan orientation. In this vein, as Jacoby (1988) suggests, partisanship acts as reference group providing cues for guiding individual political preferences. Ever since Campbell et al. (1960) who insist the unequal effect of partisan allegiance across the electorate, many scholars have found that the people depend more on their partisan cues for vote choice when they are less informed and thus have little prior perception of political objects. More recently, Lau and Redlawsk (2001) show that the less politically sophisticated tend to use the partisan cue as well as the candidate appearance cue in making vote decisions. According to Schaffner and Streb (2002), less informed

survey respondents are less able to express vote preferences when candidates' party labels are not available.

Another salient information cue affecting voters' decisions is candidate considerations indicating such factors as a candidate's personality, character, abilities, appearances, demeanor and personal history. The relevant literature disaggregates these considerations to competence, integrity, empathy, leadership, reliability, charisma and other personal characteristics (Miller et al. 1986; Rahn et al. 1990) or even more micro-level attributes like carriage and vocal tone (Rosenberg et al. 1986), etc. This literature emphasizes that these factors are less abstract and thus easier to be stored and retrieved (Miller et al. 1986: 525).

Using these information cues, or heuristic, is, according to Sniderman, Brody and Tetlock, an efficient way to organize and simplify political choices, in both the senses of "requiring relatively little information to execute, yet yielding dependable answers to complex problems of choice (Sniderman, Brody and Tetlock 1991: 19)." Therefore, scholars of this line claim that relying on information cues may not bear irrational decisions but lead voters' decisions to be

rational and mostly correct. For instance, according to Fiorina (1981), party identification is updated information based on their learning about parties through the politicians' past performance in office. On a basis of this information, Fiorina argues, voters vote for the partisan candidates who are expected to provide them with the most utility. Popkin (1991) claims that the ability of individual citizens to make sense of the political world necessarily allows collective opinion to be real and highly stable. He calls the voters having this ability "reasoning voters" with "low-information" or "gut" rationality, which is drawn from various information shortcuts that voters use to simplify the process of choosing among political choices. This reasoned choice does not require complete information but requires only the ability to predict the consequences of actions (Lupia and McCubbins 1999). By accessing particular information shortcuts, uninformed voters can emulate the behavior of well informed voters (Lupia 1994). In this sense, as Stroh (1995) argues, voters may be "pragmatic cognitive misers" who employ minimal cognitive effort to attribute their preferences on the basis of their existing knowledge of politics.

While this heuristic-based explanation is widely accepted by psychology-oriented political scientists as a compelling way to reconcile widespread political ignorance and low levels of information, it has also faced various criticisms. As a matter of fact, cognitive psychologists of heuristic literature agree that the psychic mechanisms of heuristic use are not yet clear (Kahneman, Solvic and Tversky 1982). They note that the use of heuristics is unconscious and dysfunctional, causing a certain degree of unreliability (Kuklinski and Quirk 2000: 166). The misapplication of heuristics can lead people astray in some important inferential tasks (Nisbett and Ross 1980: 18). Empirical researchers have criticized the absence of compelling empirical evidence that such information cues provide a systematic explanation to a variety of divergences between poorly and highly-informed election outcomes (Bartles 1996). As Lau and Redlawsk point out, the empirical evidence demonstrating the "very real effect of political information per se on political preferences" makes it dangerous to merely assume that heuristics overcome cognitive limitations (Lau and Redlawsk 2001: 952).

A recent, and sensible, criticism of heuristic literature asserts that it has not addressed heterogeneity among individuals in the use of heuristics and its effect on political outcomes. Kuklinski and Quirk warn that heuristic use can hardly be a rational strategy because people use information shortcuts "unknowingly and automatically" rather than carefully and accurately (Kuklinski and Quirk 2000: 156). They also point out that people not only often lack the contextual knowledge needed for the intelligent use of heuristics but also miss the environment which they impute the cues from (Kuklinski and Quirk 2000: 156). Therefore, people can take cues adequately only if they know political contexts and provisions relatively well (Kuklinski and Quirk 2000: 158). A similar argument has already been made by Mondak (1993) who shows that people are more likely to use heuristics when they have higher motivation and cognitive ability. Delli Carpini and Keeter (1996) also demonstrate that, whereas party identification has strong relationship with voters' stands on issues among more informed people, party identification among less informed people has little relation with their issue stands. From this finding, he argues that "the value of

partisanship as a shortcut to political decision making is dependent on citizens' ability to base that partisanship on more specific political information" (1996: 252).

More recently, Lau and Redlawsk (2001) consider an interaction between political sophistication and the outcomes of heuristic use. They find that political heuristics are particularly efficacious for politically sophisticated voters due to their greater ability to relate relevant information. According to their findings, although almost everyone uses various kinds of heuristics for decision-making, ironically, heuristics help only politically informed people who would need them least. They show that the use of heuristics generally increases the probability of a correct vote[4] by political experts, while it decreases the probability of a correct vote by the less politically sophisticated. Similarly, Alvarez (2001) also finds that more certain voters are better able than less certain voters to use party-related and candidate traits-related information as well as policy-oriented information. As Lau

[4] Lau and Redlawsk (1997: 586) define a correct vote decision as "one that is the same as the choice which would have been made under conditions of full information." Therefore, their concept of correctness is based on "fully informed interests of individual voters."

and Redlawsk conclude, these findings imply that heuristics may not substitute for political information in predicting correct voting (Lau and Redlawsk 2001: 966).

2.4 Information and the Spatial Theory of Voting

As seen above, the findings of empirical studies underline the importance of incorporating information heterogeneity in models of rational opinion and behavior. Interestingly enough, the same insight has long been shared by the first pioneer of rational choice theory.

Downs (1957), in his seminal book, *An Economic Theory of Democracy*, uses an "uncertainty scale" to classify voters and nonvoters. According to Downs, uncertainty, as a lack of information, divides voters into different classes with various levels of information and persuasion or political activism.[5] Activists, the

[5] Among voters are agitators (activists), passives, loyalists and quasi-informed passives, whereas nonvoters are classified as neutrals, apathetics, quasi-informed neutrals and baffleds (Downs 1957: 84-86). While agitators actively persuade others as the most certain about their decisions, passives and neutrals who are also certain are not interested in persuading others to agree with them as well as not open to others' influences. Loyalists and apathetics are habitually voting or abstaining

most informed and the least uncertain about their electoral preferences, persuade uninformed voters by providing facts favorable to the candidate or party they support. At the other extreme of the uncertainty scale are "baffleds" who are least informed and least certain, so much so that they cannot make decision. This classification suggests that activism and information play a conspicuous role in the fledging spatial theory of voting.

Spatial analysts after Downs, however, have mostly ignored information heterogeneity. In particular, the deterministic spatial model assumes full information. It posits that all voters can conceptualize a policy space, can locate their own ideal points and the candidates' positions, and can correctly respond to even an infinitesimal shift in candidate positions. This assumption is contradicted by the findings of the literature reviewed above; that the level of information in the electorate is heterogeneous and generally low.

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without becoming well-informed. Quasi-informed passives and quasi-informed neutrals are uncertain but reach the tentative conclusions about their preferences.

Probabilistic voting models take uncertainty into account to mitigate this inconsistency between information literature and the spatial theory of voting. Since such scholars as Hinich, Ledyard, and Ordeshook (1972), Hinich (1977), Coughlin and Nitzan (1981) developed the concept of probabilistic voting and Enelow and Hinich (1981) introduced the spatial model that allows for voters' uncertainty about candidate positions, most spatial analysts have agreed that the mass public is not certain about candidate positions and that the voting model should contain an element of uncertainty that allows some positive probability for choosing a candidate who is not closest to the voter in the predictive space (Lin et al. 1999: 60). Some empirically-oriented scholars confirm that uncertainty about candidate positions is pervasive among voters and an important determinant of electoral choices (Bartles 1986; Alvarez 2001).

During the last decades, spatial theorists have been interested in the implications of uncertainty in relation to electoral equilibrium, which is difficult to obtain in deterministic spatial voting models. Enelow and Hinich (1989) develop a general probabilistic spatial model of voting for two-candidate

competitions where the likelihood of global equilibrium depends on size of the variance of the random disturbance term of the voting function, as well as on factors such as policy salience, degree of concavity of voter utility functions, the size of feasible set of candidate policy locations, and the dimensionality of the policy space. The authors show that, as the variance of the random error term increases, it becomes easier to satisfy the sufficient condition for candidate equilibrium.

Expanding this model to the case of multi-candidate competitions, Lin et al. (1999) prove that a large degree of voter uncertainty is a sufficient condition for concavity of the candidate expected vote function in multi-candidate, multidimensional probabilistic spatial voting. Under concavity, rational candidates converge at a “minimum-sum point” at which total distances from all voter ideal points are minimized as a geometric center of the ideal point distribution. The authors demonstrate with several different distance measures that, if voter uncertainty is beyond a certain point, convergent equilibrium is globally stable.

These findings show that the generally high level of voter uncertainty as revealed by information literature does figure into spatial theory with important implications. However, as discussed above, analysts assume that the random variable in these models is independently and identically distributed - a homogeneity assumption that is contradicted by information literature. A basic assumption of probabilistic models is that voter uncertainty varies across the candidates as a function of such factors as campaign spending and incumbency, but is homogeneous across the individual voters.

Notable exceptions are Aldrich (1983a, 1983b) and Schofield's recent articles with his associates (Schofield 2003; Miller and Schofield 2003; Schofield et al. 2003; Schofield and Sened 2005), both of which emphasize the role of political activists. By incorporating activism into their spatial models, their works revive Downs' argument of voter heterogeneity on the uncertainty scale.

Aldrich (1983a, 1983b) argues that an individual's utility calculation depends on the average preference of the party activists rather than that of all voters. According to him, in a unidimensional space, parties are stable at cleaved

positions, where party activists are distributed in a way that they are "relatively cohesive internally and relatively distinctive from each other" (Aldrich 1983a: 985). In general, in a multidimensional space where the two parties compete over a single mode, alienation and indifference as a part of the activist's decision calculus contribute to electoral stability (Aldrich 1983b). Equilibrium exists where alienation from a party induces convergence toward the densest concentration of ideal points of activists, while indifference between becoming an activist in either party is a diverging force that keeps parties from being too close to each other.

Schofield and his associates also note that the need to enhance an activist-generated valence leads candidates to take divergent positions in equilibrium. In their model in which voter utility is a function of the valence terms as well as the distance between the candidate and the voters,[6] the activist-generated valence is

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[6] The formal expression of the model is as follows:

$$U_{jm} = \lambda_j(z) - \beta \left\| \pi_j - z_m \right\|^s + \varepsilon_{jm}$$

where λ_j is the activist valence , a differential function of π which is concave in π_j , with all other notations being the same as those discussed in Section 2.1.

presumed as a function of the policy choices of the candidates, while the candidate popularity valence is characterized by the stochastic error term assumed to be i.i.d. (independently and identically distributed). A candidate's policy positions motivate activists to contribute resources to the candidate and those resources that the candidate can use to enhance his/her valence. According to the authors, because the vote-maximizing candidate must appeal to both activists, who are more concerned about maintaining the ideological stance of the party, and disaffected or ordinary voters, who see no perceptible difference between the two parties' policy positions, "a rational candidate chooses a policy position so as to balance activist contributions and voter responses (Miller and Schofield 2003: 253)."

Although Aldrich and Schofield and his colleagues are not particularly concerned with uncertainty varying across voters, their findings verify that voter heterogeneity in political activism is a crucial element in the vote process and the optimal candidate positions. As the level of political activism forms the uncertainty scale in Downs' work, those findings infer the existence and

importance of heterogeneity in voter uncertainty. Splitting voters into three sub-groups based on levels of uncertainty about the candidate policy positions, Alvarez (2001) provides empirical evidence not only that voters' uncertainty levels vary but also that more uncertain voters and less uncertain voters are different in their candidate preferences and decision-making processes. He finds that a voter more uncertain about a candidate's policy positions is less likely to vote for that candidate.

Built on these theoretical and empirical findings as well as the findings of the information literature, the present study assumes that uncertainty or risk of the vote process is not homogeneous across the voters particularly because the voters are heterogeneous in the levels of political activism or information. By hypothesizing that uncertainty is a function of information and political activism, I incorporate the heterogeneity of voter uncertainty in the spatial voting model.

The theoretical and methodological approaches in this study are borrowed from Lin (2005)'s study on information and ideological structure in Taiwan's 2004 presidential election. By addressing the heterogeneity of voter uncertainty in

the spatial model of binary choice, Lin discovers that variations in political activism and such information cues as partisan strength have direct influences on voter uncertainty. Lin argues that, "in light of recent developments in both the information literature and the spatial theoretic literature, it is time that spatial analysts revisit Downs (1957) and reunify the literature" (2005: 7).

This dissertation applies Lin's spatial modeling with different specifications to the data from the recent four presidential elections in the U.S. to investigate how information heterogeneity among the voters affects the spatial structure and voting of the U.S. electorate. Whereas vote choice in the 2004 Taiwan election was dependent dominantly upon spatial proximity based on Green vs. Blue ideological cleavage (Lin, 2005: 2), vote choice in the four recent U.S. presidential elections were not defined by a single dominant dimension, but affected by several non-policy considerations in addition to several campaign issues. It is not implausible to expect that those non-policy considerations as information cues may decrease uncertainty among less informed and less active voters; and as a result, eliminate the gap between informed/active voters and

uninformed/inactive voters in their uncertainty levels. The primary question of this dissertation is, therefore, whether uncertainty varies across the electorate as a result of information heterogeneity in the U.S. electoral context, in which various non-policy factors provide the voters with important voting cues.

If there is a significant gap in the level of uncertainty between the informed/active and the uninformed/inactive, an essential question that can be taken up is: "What is the consequence of (heterogeneous) uncertainty?" In relation to this question, a significant divergence exists among spatial analysts. The following section discusses the disagreement with respect to the role of uncertainty in determining the election outcome.

2.5 Electoral Consequences of Voter Uncertainty

The spatial voting model basically assumes that voters' utilities are a function of the distances between each voter's most preferred position and the candidate's expected positions. Enelow and Hinich (1981, 1984-a) extend this

spatial model to allow for the probability that voters are uncertain about the candidates' issue positions. Formally, their model is

$$U_{ji} = -\sum_{k}(\pi_{jk} - z_{ik})^2 - \sum_{k} V_{jk} + C_{ij}$$

where π_{jk} and z_{ik} denote the positions of the j[th] candidate and i[th] voter on issue k; V_{ijk} represents the variance of the distribution of j's location on issue k. it is assumed to be identical for each voter; and $C_{ij} > 0$ is a constant representing the non-policy value of candidate j to voter i.

. In Enelow and Hinich's model, the component of uncertainty that is represented as the variance, is simply an additional factor determining voters' utilities. Hence, the expected utility, or vote choice, depends not only on the quadratic distance between the candidate's location and each voter's ideal point, but also on the variance of the voter's perceptions (uncertainty). As the utility function here is concave with quadratic issue distances, this utility calculus assumes that voters are risk-averse (Bartels, 1986; Berinsky and Lewis, 2007). This implies that "voters discount a candidate with a given level of uncertainty (Berinsky and Lewis, 2007: 142)", and as a consequence, are less likely to vote

for the candidate whose positions they are relatively uncertain about, as long as the expected positions of the two candidates are the same.

The utility model employed in this study also has the same assumption in voters' risk preference by using quadratic Euclidean distances. The only difference with Enelow-Hinich model is that whereas their model assumes the variance as fixed across the electorate, the model of this study assumes the variance as a function of exogenous variables, that is,

$\sigma_i = \exp(Z_i\gamma)$ where Z_i is exogenous variables.

Achen (2002) points out that the utility model compromising the component explaining heteroskedasticity is almost equivalent to the Enelow-Hinich model with $Z_i\gamma$ replacing the variance. Therefore, the exogenous variables (information and activism here) not only affect the disturbance variance, but also affect the utility directly.[7] That is, if the standard deviation of the model (σ_i) is a negative function of information and activism, according to Achen, it is almost equivalent to the model having information and activism as independent

[7] Formal descriptions for this as well as for the Enelow-Hinich model are contained in Chapter 6.

variables with positive signs, assuming that the intercept attached to $Z_i\gamma$ is positive. The straightforward substantive interpretation of this is that the more information a voter has about a candidate, the more likely s/he is to vote for that candidate. This clearly reflects voters' risk-aversion attitude that attempts to avoid risk from supporting the candidate with uncertain positions.

Empirical analyses have also found that voter uncertainty about the candidate positions depresses the voter's utility for the candidate and hence the probability of supporting the candidate. Bartels (1986) estimates the effect of uncertainty on vote choice and discovers that the voters dislike uncertainty. He finds that voter uncertainty in the 1980 presidential election had a negative effect on vote choice to a similar degree to that of issue distances. Similarly, with the measure of uncertainty based on the squared dispersion of the voters' perception of the candidate's position and the candidate's true position, Alvarez (2001) also provides empirical evidence from the voters in the 1976 to 1996 presidential elections that the greater the voter's uncertainty about the candidate's policy

positions, the less likely the voter was to support the candidate, all other things held constant.

Scholars have found that uncertainty is generally less for incumbents or better-known candidates than it is for challengers or lesser-known candidates (Alvarez 2001; Bartels 1986; Enelow and Hinich 1984-a). Because challengers usually do not emerge nationally until the Spring primaries, they lag behind in public awareness. Thus, under the assumption of risk-aversion, a greater level of voter uncertainty about the challenger's policy positions may be a critical source for the disadvantages and uphill tasks that challengers usually face.

The finding of Sniderman et al. (1991) also highlights the prominence of the incumbent that the challenger is hard to match. Their finding demonstrates that poorly informed voters do not learn about or pay attention to the challenger, but instead, they are interested only in the incumbent. According to the authors, the key difference between the well-informed and the poorly-informed in their vote choices is that the well-informed make decisions by comparing the two candidates, whereas the poorly-informed judge on the basis of the incumbent's

performance, particularly with respect to national economic conditions. This finding implies that voters may have different voting preferences because of their heterogeneity in information levels, which make the voters' dominant considerations vary. As uninformed or uncertain voters tend to pay little attention to the challenger's position, compared to informed or certain voters, they would be more likely than informed or certain voters to vote for the incumbent rather than the ambiguous challenger, if all other things being equal. In Chapter 6, I derive a model of uncertainty from the Enelow-Hinich model and Achen's formulation related to the heteroskedastic probit model, with the expectation that the more uncertain a voter is about the challenger, the more likely the voter is to vote for the incumbent. With this model, the chapter explores whether heterogeneity in uncertainty produce any systematic difference among voters in their voting preferences.

2.6 Hypotheses and Expectations

This study examines the effect of information heterogeneity in spatial voting. For this purpose, an attempt is made to unify the literature discussed above: the literature of spatial voting and the literature of political information, or sophistication. Drawing insight from Downs' (1957) early findings on uncertainty, coupled with recent developments in both spatial theory and public opinion research; the following hypothesis and expectations are proposed:

Hypothesis 1: Uncertainty about candidate preference will not be homogeneous across the electorate, but will be a function of information and activism.

Expectation 1: In the circumstance of issue voting, where voter utility is differentiated by issue proximity, voter uncertainty regarding vote choice will be decreased as the voters become more informed and more active. Because the less informed and the less active are those who have trouble in ideologically conceptualizing positional issues

and perceiving true candidate positions on those issues, the effect of information heterogeneity on voter uncertainty regarding issue voting will be more evident than in other electoral circumstances.

Expectation 2: Because heuristic use provides voters with cues about how the candidates will perform in office, it will decrease the uncertainty for all voters. However, those information cues will not be enough to eliminate heterogeneity of uncertainty. With those cues available to voters, the uninformed and the inactive will still have greater uncertainty about the candidates than well-informed and active voters.

This study is also interested in the electoral consequences of heterogeneity in voter uncertainty. Both the theoretical and empirical findings based on the assumption of risk aversion suggest the following hypothesis:

Hypothesis 2: Voters tend to dislike the candidate who they are relatively uncertain about, all other things held constant. As uncertain voters

are less likely to know about the challenger than the incumbent, whereas certain voters are likely to be relatively well informed about both the challenger and the incumbent, uncertain voters will be more likely than certain voters to vote for a well-known candidate or the incumbent.

CHAPTER 3

A Model of Heteroskedastic Error and Measurement

To explore voter uncertainty heterogeneous across voters in a spatial voting model, I employ a heteroskedastic probit model for vote choice, which Lin proposes (2005). The heteroskedastic probit model, discussed in Section 3.2, has a separate equation to model the error variance. Whereas standard probit estimations for binary choices assume an equal variance across observations, the heteroskedastic probit model can accommodate expectations of heteroskedastic errors. I hypothesize that voter uncertainty about candidates is heterogeneous across voters as a function of information and political activism. Therefore, the variance equation of the heteroskedastic probit model accounts for how these two variables affect the error variance of vote choice. The heteroskedastic probit model is tested using American National Election Study (ANES) data from four recent presidential election years.

The vote choice equation of the heteroskedastic probit model employed in this study specifies the key assumption of the spatial theory of voting: voting utility is a linear function of spatial proximity between positions of candidates and voters. I discuss the measurement of distance between candidates and voters in Section 3.2. To estimate candidate and voter positions in the issue dimensions, I use the Aldrich-McKelvey scaling method applied to the ANES data. I explain the measurement and operationalization of the survey items applied to the heteroskedastic probit model and the Aldrich-McKelvey scaling methods in Section 3.3.

3.1 A Heteroskedastic Probit Model of Spatial Voting

To specify information heterogeneity on the probabilistic spatial voting model, I employ the heteroskedastic probit model that Lin (2005) developed for spatial voting in the 2004 Taiwan presidential election[8] but with some different

[8] This dissertation owes its methodological strategies to Lin's 2005 paper to a substantial degree. The description of the heteroskedastic probit model in this section is borrowed from what Lin portrays in his paper.

specifications. The heteroskedastic probit model differs from a standard probit model in that it can directly account for errors in prediction by estimating the error variance in a separate equation. Because the unequal variance may make the maximum likelihood estimators inconsistent in a dichotomous choice model (Yatchew and Griliches 1985: 135), it is essential that the heteroskedasticity be specified in a probit model. By specifying and estimate simultaneously the equation of the probability of a choice and that of the error variance, the heteroskedastic probit model is expected to produce consistent estimates.

In the probabilistic spatial theory of voting, a voter's utility for a candidate is specified as a linear function of spatial proximity and a random variable representing a voter's uncertainty about the candidate.

Let U_{ji} represent voter *i*'s utility for candidate *j*:

$$U_{ji} = \beta \left\| \pi_j - z_i \right\|_A^s + \varepsilon_{ji} \qquad \varepsilon_{ji} \sim N(0, \frac{\sigma^2}{2})$$

Here π_j and z_i denote the coordinates of the j[th] politician and i[th] respondent in a k-dimensional policy space; $\left\| \pi_j - z_i \right\|_A^s$ denotes a measure of distance between π_j and

z_i.[9]; the coefficient β is customarily set at -1; and ε_{ji} is the noise resulting from inaccurate transmission of the actual candidate position to voters (Enelow and Hinich 1984-a: 123) or from i's non-policy considerations concerning candidate j. Typically, ε_{ji} is assumed to be independently distributed for each candidate and follow a normal distribution with zero mean and homoskedastic variance σ_j^2.

In an election with two candidates, *j*=0, 1, voter *i* is assumed to vote for candidate 1 if and only if her utility for candidate 1 exceeds her utility for candidate 0:

$$U_{1i} - U_{0i} = \beta(\|\pi_1 - z_i\|^s - \|\pi_0 - z_i\|^s) - \varepsilon_i > 0 \qquad (1)$$

where $\varepsilon_i \equiv \varepsilon_{0i} - \varepsilon_{1i} \sim N(0, \sigma^2)$.

Because utilities are unobservable in practice, vote choice, which is observable, usually substitutes for utility.

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[9] $\|\pi_j - z_i\|_A^s = [\sqrt{(\pi_j - z_i)' A(\pi_j - z_i)}]^s$. A is a kxk symmetric, positive definite matrix, which defines a symmetric preference rule (Enelow and Hinich 1984-a: 16) meaning an equivalent salience of policy dimensions for the voter. For simplicity, I assume that A is an identity matrix. With A=I, if s=1, simple Euclidean distance is used. And if s=2, the quadratic Euclidean distance is used.

Equation 1 is therefore adequately represented as

$$
\begin{aligned}
&\Pr[Vote = 1] \\
&= \Pr[U_{1i} - U_{0i} > 0] \\
&= \Pr[\varepsilon_i < \beta(\|\pi_1 - z_i\|^s - \|\pi_0 - z_i\|^s)] \\
&= \Pr[\frac{\varepsilon_i}{\sigma} < \frac{\beta(\|\pi_1 - z_i\|^s - \|\pi_0 - z_i\|^s)}{\sigma}] \\
&= \Phi[\frac{\beta(\|\pi_1 - z_i\|^s - \|\pi_0 - z_i\|^s)}{\sigma}]
\end{aligned}
\qquad (2)
$$

where Φ() is the cumulative distribution function (cdf) of the standard normal distribution.

Equation 2 is the standard probit model. Once candidate positions and voter ideal points have been estimated, a maximum likelihood procedure can estimate the model. Its likelihood function is:

$$\log L(p \mid y) = \sum_{i=1}^{N} y_i \log \Phi\left(\frac{X_i \beta}{\sigma}\right) + (1 - y_i) \log\left[1 - \Phi\left(\frac{X_i \beta}{\sigma}\right)\right] \qquad (3)$$

where p is the probability of voter i's vote choice (y_i)

and $X_i = \|\pi_1 - z_i\|^s - \|\pi_0 - z_i\|^s$.

Conventional probit estimations assume that the variance of the function (σ) is constant. In practice, it is often simply assumed that σ=1 (Maddala 1983). This

assumption infers that all voters have the same level of uncertainty about candidates.

In this study, I argue that the variance of the vote choice function is not constant but is a function of candidate information and political activism. In normal circumstances of a democracy, better informed and more active voters may be relatively certain about candidate policy positions and thus able to locate candidates more correctly in the policy space, whereas less informed and less active voters have difficulties in figuring out where the candidates are located. The heteroskedastic probit model allows for addressing this heterogeneity across voters by modeling the error variance of vote choice. Heterogeneity is incorporated in Equation 2 by parameterizing σ such that

$$\sigma = \exp(\gamma' x_i) \qquad \text{or} \qquad \log(\sigma) = \gamma' x_i$$

where x_i is a vector of covariates representing information and activism and γ is a vector of coefficients to estimate.

With the assumption of heteroskedasticity, Equation 2 becomes a heteroskedastic probit model that includes the variance equation in the denominator:

$$\Pr[Vote = 1] = \Phi[\frac{\beta(\left\|\pi_1 - z_i\right\|^s - \left\|\pi_0 - z_i\right\|^s)}{\exp(\gamma' x_i)}] \quad (4)$$

Two different equations are featured in the model by formulating heterogeneous voter choices: a model of choice in the nominator and a model of the error variance in the denominator. These can also be estimated by a maximum likelihood procedure (Harvey 1976):

$$\log L(p \mid y) = \sum_{i=1}^{N} y_i \log \Phi\left(\frac{X_i \beta}{\exp(\gamma' x_i)}\right) + (1 - y_i) \log\left[1 - \Phi\left(\frac{X_i \beta}{\exp(\gamma' x_i)}\right)\right] \quad (5)$$

where p is the probability of voter i's vote choice (y_i)

and $X_i = \left\|\pi_1 - z_i\right\|^s - \left\|\pi_0 - z_i\right\|^s$.

As the model has two separate equations to be estimated, it allows for a joint test of the two theoretical hypotheses: The first hypothesis is $\beta < 0$, meaning that the closer a candidate's position is to a voter's ideal point in the policy space, the more likely the voter is to vote for the candidate. This is the key assumption of the probabilistic spatial theory of voting, which is applied both to homoskedastic probit and heteroskedastic probit.

Regarding the variance equation, I hypothesize $\gamma < 0$, indicating that the more informed and active a voter is, the less uncertain s/he is about her/his candidate preference. This hypothesis is central to the study of political information.

3.2 Estimating Candidate Positions and Voter Ideal Points

To estimate the heteroskedastic probit model whose choice equation is specified by the proximity between candidate positions and voters' most preferred positions (ideal points), candidate positions and voter ideal points must first be estimated. The American National Election Studies (ANES) surveys have items asking respondents to place their own positions and the perceived positions of major candidates and parties on a series of seven-point issue scales. For the ANES data, I use the Aldrich-McKelvey scaling technique (1977) to recover the positions of candidates, parties and respondents in a common issue space. Relying on "a principal components solution for the candidate parameters together with a

regression estimate of the voter parameters" (p.112)[10], the A-M scaling procedure intends to eliminate errors resulting from respondents' own interpretations of the seven-point scales that are attributable to methodological difficulties in the analysis of the data. According to Aldrich et al. (1982: 392-394), the problems associated with the seven-point scales concern the status quo, labeling, reliability, and location and intensity. The key issue related to these problems is that the respondents should interpret the meaning of points arbitrarily because each point does not convey a certain policy position. The scaling model recovers the candidates' (and parties') true, fixed, positions and sorts out distortions created by respondents' interpretation of the data to obtain the respondents' recovered ideal points.

Formally, let Y_{ij} denote the i^{th} respondent's perception of candidate j; then Y_{ij} is generated by the following model:

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[10] The A-M scaling method is a procedure similar to the usual factor analysis. Only difference between the A-M procedure and the usual factor analysis is that the A-M method treats the common factor as parameters to be estimated, while the factor analysis generally treats the common factor as a random variable (See Aldrich and McKelvey 1977: 117).

$$Y_{ij} = \pi_j + e_{ij} \tag{6}$$

where π_j is the true position of *j* and e_{ij} is a random disturbance with an expected value of zero, the variance of σ^2 and zero covariance for all *i*'s and *j*'s. The model thus assumes that the i^{th} voter's reported position of candidate *j* denoted by X_{ij} consists of some arbitrary linear transformation of the respondent's perception of the space. The transformation is formalized as follows:

$$Y_{ij} = \pi_j + e_{ij} = c_i + w_i X_{ij}, \tag{7}$$

that is, $$X_{ij} = \frac{1}{w_i}(Y_{ij} - c_i) + \frac{e_{ij}}{w_i} \tag{8}$$

where c_i and w_i are distortion parameters accounting for the actual survey situation. A negative w_i means that the positions voter *i* reported for candidate *j* are negatively correlated with the estimated position of *j*.

Let $\hat{Y}_j$, $\hat{c}_i$, $\hat{w}_i$ denote the estimates of the true parameters and set

$$\hat{Y} = \begin{bmatrix} \hat{Y}_1 \\ \cdot \\ \cdot \\ \cdot \\ \hat{Y}_j \end{bmatrix}, \quad \hat{\beta}_i = \begin{bmatrix} \hat{c}_i \\ \hat{w}_i \end{bmatrix}, \quad \text{and} \quad X_i\hat{\beta}_i = \begin{bmatrix} \hat{c}_i + \hat{w}_i X_{i1} \\ \cdot \\ \cdot \\ \cdot \\ \hat{c}_i + \hat{w}_i X_{ij} \end{bmatrix}$$

The A-M scaling procedure is to choose $\hat{Y}$ and $\hat{\beta}_i$ in the way as to get the best fit in a least squares sense. That is,

$$\hat{Y} = X_i\hat{\beta}_i - e_i \quad \text{and}$$

$$\sum_{i=1}^{n} e_i' e_i = \sum_{i=1}^{n} (\hat{Y} - X_i\hat{\beta}_i)'(\hat{Y} - X_i\hat{\beta}_i). \tag{9}$$

And the solution for $\hat{\beta}_i$ is

$$\hat{\beta}_i = (X_i' X_i)^{-1} X_i'\hat{Y}. \tag{10}$$

Therefore, "the individual transformation consists of the least-squares regression of the reported on the actual (unknown) positions of the candidates (115)." The candidate position estimated by this procedure does not correspond to the average perception of his position ($\frac{\sum \hat{Y}_i}{n}$) but features

$$\hat{Y} = \frac{\sum \hat{Y}_i}{n + \lambda}$$

where $\lambda = -\sum_{i=1}^{n} e_i' e_i$; and $\hat{Y}_i = X_i\hat{\beta}_i$ is an estimate of the i[th] voters' perceptions of the candidate positions.

The values of $\hat{c}_i$ and $\hat{w}_i$ are used to estimate the respondents' ideal points. The A-M scaling procedure for individual ideal points uses the same transformation used to scale the candidate positions. Thus, if X_{i0} denotes *i*'s

placement of his/her ideal point, the rescaled position of *i* ($\widehat{Y}_{i0}$) is formalized as follows:

$$\widehat{Y}_{i0} = \widehat{c}_i + \widehat{w}_i X_{i0} \tag{11}$$

For the empirical analysis, I use a quadratic Euclidean distance measure for proximity calculations of the positions rescaled by the Aldrich-McKelvey procedure. In the spatial voting model, with quadratic Euclidean distance, all candidates are expected to converge at the mean of voter ideal points (Lin et al. 1999: 70–72). In probabilistic spatial voting, if candidate j's expected vote is concave and the minimum-sum point is unique, a convergent equilibrium exists at the minimum-sum point, which is the shortest total distances from all voter ideal points. With quadratic Euclidean distance, the minimum-sum point is the voters' mean position on all dimensions (Lin et al. 1999: 70).

The concave function in form of quadratic Euclidean distance implies the assumption of risk-aversion. Risk-averse voters are expected to vote for the candidate whose expected utility is greater for sure. They do not prefer the risky

gamble, and thus, do not want to support the candidate whose positions they are relatively uncertain about. By employing quadratic Euclidean distances, this dissertation also assumes that the voters are risk-averse.

3.3 Measurement and Operationalization

I test the heteroskedastic probit model established to examine uncertainty about candidate preference using ANES survey data from the four most recent presidential election years.

The dependent variable of the model is the vote share of the Republican candidate in the two-candidate competitions[11].

[11] Because the heteroskedastic probit model is built on binary choice, the dependent variable is set to be binary, and thus, includes only the respondents who voted for the candidates of the two major parties. While this is, normally, not a critical problem because the elections in the U.S. are usually reduced to two-candidate competitions, the exclusion of Perot may produce somehow distorted prediction of votes in 1992, when Perot obtained around 20% of the total votes. However, because voter uncertainty about Perot may be greater than voter uncertainty about the two major-party candidates, the exclusion of Perot is only expected to decrease the variations in uncertainty among voters. Hence, the exclusion is not anticipated to work to intensify the expected results.

Regarding the choice equation, the ANES surveys have several seven-point scale issue items[12] on which respondents are asked to place their own positions and candidates' and parties' positions. To estimate the distance between the candidate (party) positions and voter ideal points, I applied the Aldrich-McKelvey (A-M) scaling procedure to the data to define three-dimensional issue spaces. The three issue items for each of the four years are as follows[13]:

1992: Government's spending and services (spending and services), government's concern about jobs and a good standard of living (jobs and standard of living), and defense spending

1996: Spending and services, defense spending, and trade offs between environmental protection and jobs and living standards (jobs vs. environment)

2000: Spending and services, jobs and standard of living, and defense spending

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[12] The only exception to seven-point scale is *Abortion*, which is a four-point scale item. This item is weighted to be adjusted to a seven-point scale.

[13] Full texts of the questionnaires and codes are available in Appendix to Chapter 3.

2004: Spending and services, jobs and standard of living, and interventionism by diplomacy or military action (interventionism)

These items are the most salient issues among the respondents in each survey sample. The surveys include more than three issue placement items applicable to the A-M procedure. However, inclusion of many items in the analyses leads to loss of many cases and thus to the empirical validity of the analysis. Furthermore, the procedure removes respondents who placed all candidates/parties on the same point on an issue. Hence it is more sensible to use only the most salient items[14].

With respect to the salience of the issues, two different measurements are used. The surveys of 1996 and 2004 ask the respondents how important each issue is to them personally. Table 3.1 displays the aggregate magnitudes of importance for each issue. I compared those magnitudes to choose the three most salient issues.

[14] In the 1992 survey, only three issue items ask to place the positions of both the major candidates and parties as well as the respondents' own positions. This actually decided the number of items included in the analyses.

Table 3.1. Salience of Issues, 1996 and 2004

	1996	2004
Government's Spending and Services	.708	.712
Defense Spending	.658	.689
Job vs. Environment	.663	.652
Government's Concern about Job and Good Standard of Living	N/A	.705
Aid to Blacks	N/A	.599
Interventionism by Diplomacy or Military	N/A	.726
Women's Role	N/A	.736
Abortion	.715	.704

In 2004, the three items most salient to the respondents includes *Women's Equal Role*. The issue of Government's Concern about Job and Good Standard of Living is actually the fourth salient issue in the 2004 NES data. However, since there is apparently greater misperception of candidate positions on *Women's Equal Role*, it only decreases the predictability of the model, although it may strengthen our argument about the heterogeneity of uncertainty. The predictabilities of the issues in 2004 are exhibited in Table 3.2.

Table 3.2. Percentages of Correct Prediction by Issue Proximities, ANES 2004

Issues & Models	% Correctly Predicted	
	All voters	Voters included in the analysis only
Spending & service (S)	82.5	84.1
Job & standard of living (J)	81.7	81.3
Women's role (W)	73.4	74.1
Interventionism (I)	80.4	85.0
S+J	87.1	87.3
S+W	81.5	81.8
S+I	88.1	88.8
J+W	80.1	81.0
J+I	87.9	88.2
W+I	79.3	79.8
S+J+W	82.9	82.7
S+J+I	90.0	89.3
S+W+I	84.3	84.4
J+W+I	83.5	84.1
S+J+W+I	86.6	86.5

Table 3.3. Probit Coefficients of Issue Items for Vote Choice 2000
(Vote for Bush=1)

Issue	Model 1	Model 2
Government's Spending and Services	.289 (.032)***	.195 (.052)***
Defense Spending	.213 (.036)***	.143 (.054)**
Government's Concern about Job and Good Standard of Living	.168 (.033)***	.151 (.049)**
Aid to Blacks	.108 (.032)**	-.004 (.048)
Partisanship		.464 (.047)***
Candidate Leadership		.720 (.085)***
Constant	-3.479 (.262)***	-4.159 (.043)***
N	746	704

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

For the survey of 2000 having four items applicable to this analysis, I used a standard probit analysis of voting choice to decide the three best predictors of vote choice. Table 3.3 displays the probit coefficients of issue items for vote choice in 2002. Whereas the coefficient for *Aid to Black* is smallest though

significant when only issue items are included as the predictors (Model 1 in Table 3.3), it loses its statistical significance when variables other than issue items are considered as covariates (Model 2 in Table 3.3).

Other than the distance between the average perceived candidate/party positions that are normalized by the A-M procedure and the rescaled voter ideal points, I add partisanship and candidate leadership as covariates of the choice function. The seven-point scale continuum from strong Democrat (1) to strong Republican (7) is used as partisanship measure. And the value of candidate leadership is obtained by subtracting the value attached to Democratic candidate from the Republican candidate's value in the four-point scale leadership question asking if the candidate provides strong leadership.

The variance equation contains two different variables under the assumption that the variance is the function of information and political activism. For political information, I use the measure that Palfrey and Poole (1987) developed based on the A-M scaling method. To measure an individual level of political information, they developed an information index from the correlation

between an individual's self-reported candidate/party positions on a seven-point scale and the true candidate/party position scaled by the A-M procedure. I use three issue items to measure the distance between the candidates and the respondents themselves, so I computed the mean correlation for each respondent on those three issues. The higher the correlation, the more informed the individual is about the candidate positions.

Political activism is a count of the respondents' campaign activities, including persuading others for vote decision, participating in meetings/ rallies/speeches, displaying buttons/stickers/signs, and contributing time and money. The operationalization of these variables is explained in the Appendix to this chapter.

CHAPTER 4

Variability in Opinions and Voting Choices in the U.S. 1992–2004

The key idea underlying the proximity spatial model is that voters choose the candidates whose positions are closest to their own positions on various policy dimensions or on hypothetical predictive dimensions. But a crucial issue related to proximity voting is that voters have limited information and thus have difficulty conceptualizing the policy issues and figuring out the positions of the candidates for whom they vote. This issue leads the traditional deterministic spatial voting model to face vehement criticisms with respect to voter uncertainty. In the process of addressing those critiques, the spatial model has extended its elements to encompass elements of uncertainty.

However, what they have ignored is whether the uncertainty arising from limited information is identical across voters, given that voters have different levels of information. Most spatial voting models simply assume that voter uncertainty is an identically distributed random error. Some spatial theorists claim

that various information cues provide enough information about candidates for uninformed voters to behave as if they were informed. I argue that this assumption is unrealistic. In the normal electoral environment of a democracy, voters who have less information about the candidates may realistically have a wider distribution of uncertainty than those who have more information.

This chapter provides the preliminary observations describing this heterogeneity, which I will address in the next chapter in a unified spatial voting model that comprises the sources of uncertainty. Section 4.1 examines the positions of candidates and voters on the three issue dimensions that were most salient among ANES survey respondents in the 1992–2004 presidential elections. The Aldrich-McKelvey scaling method discussed in Chapter 3 offers a reliable estimation of those positions. The recovered positions demonstrate the characteristics of the American opinion distributions in each election year. However, these opinion distributions and voter perceptions of the candidates are not expected to be constant across all voters. Studies have revealed that the more and the less informed differ in their issue conceptualization and candidate

perceptions. Section 4.2 explores this discrepancy between more and less informed/active voters. Because uncertainty in spatial voting results primarily from difficulty in conceptualizing issues and placing candidate positions, the heterogeneity in these two components is surely the most significant basis for the heterogeneity in voter uncertainty. In Section 4.3, I present the discrepancy between more and less informed/active voters in their uncertainty about vote choices using simple calculations for correctness of voting. The findings strongly support my argument about the need for a voting model that accommodates this heterogeneity. Section 4.4 concludes the chapter with a short discussion of the implications of my findings regarding American voter uncertainty being heterogeneous across individuals and a fallacy of standard probit analysis in addressing this heterogeneity. I suggest a vote choice model that accommodates the heteroskedasticity of the error variance.

4.1 The Positions of Candidates and Voters

Using the Aldrich-McKelvey scaling technique, I recovered the positions of the two major candidates and the parties as well as the voters. The re-scaled estimates of the candidate/party and the voter positions on the three issues are presented in Tables 4.1–4.4. The distributions of the re-scaled voter ideal points and candidate positions are displayed in Figures 4.1–4.4.

As expected, the positions of the candidates of the Democratic Party and the positions of the candidates of the Republican Party are placed in opposite directions with the mean and median voter ideal points located between the two. However, the candidate positions tend to be in the middle of the scale rather than in extreme positions. Overall, the scaled positions of the voters do not appear significantly skewed to one side.

Table 4.1. Scaled Estimates of Candidate Positions on Three Policy Issues in 1992

Issues	Clinton	Bush	Dem. Party	Rep. Party	Mean Ideal Points	Median Ideal Points
Spending & Services	-. 481 (.235)	. 494 (.237)	-.519 (.240)	. 506 (.248)	.034 (.855)	-.014
Job & Standard of Living	-.489 (.234)	.508 (.232)	-.511 (.249)	. 491 (.250)	.014 (.941)	.000
Defense Spending	-.499 (.246)	. 491 (.237)	-.501 (.266)	.509 (.264)	-.318 (.884)	-.210

Standard deviations are in parentheses.

Table 4.2. Scaled Estimates of Candidate Positions on Three Policy Issues in 1996

Issues	Clinton	Dole	Dem. Party	Rep. Party	Mean Ideal Points	Median Ideal Points
Spending & Services	-. 487 (.250)	. 489 (.253)	-.513 (.260)	. 511 (.262)	.137 (.793)	.125
Job vs. Environment	-. 511 (.303)	.468 (.306)	-.487 (.322)	.531 (.311)	-.175 (.946)	-.117
Defense Spending	-.504 (.304)	. 487 (.306)	-.496 (.325)	.513 (.299)	-.119 (.955)	-.120

Standard deviations are in parentheses.

Table 4.3. Scaled Estimates of Candidate Positions on Three Policy Issues in 2000

Issues	Gore	Bush	Dem. Party	Rep. Party	Mean Ideal Points	Median Ideal Points
Spending & Services	-. 494 (.271)	. 483 (.285)	-.529 (.268)	.540 (.263)	.087 (.888)	.000
Job & Standard of Living	-.481 (.285)	. 494 (.276)	-.532 (.269)	.518 (.268)	.207 (.922)	.398
Defense Spending	-.484 (.372)	.509 (.361)	-.516 (.382)	.491 (.374)	-.104 (1.400)	.019

Standard deviations are in parentheses.

Table 4.4. Scaled Estimates of Candidate Positions on Three Policy Issues in 2004

Issues	Kerry	Bush	Dem. Party	Rep. Party	Mean Ideal Points	Median Ideal Points
Spending & Services	-.491 (.249)	.501 (.255)	-.509 (.257)	.499 (.249)	.067 (1.448)	-.081
Job & Standard of Living	-.487 (.251)	.517 (.253)	-.513 (.260)	.483 (.265)	-.028 (1.615)	.016
Interventionism	-.535 (.224)	.584 (.188)	-.455 (.223)	.407 (.219)	-.273 (.758)	-.250

Standard deviations are in parentheses.

Figure 4.1. Distribution of Scaled Ideal Points and Candidate Positions, 1992

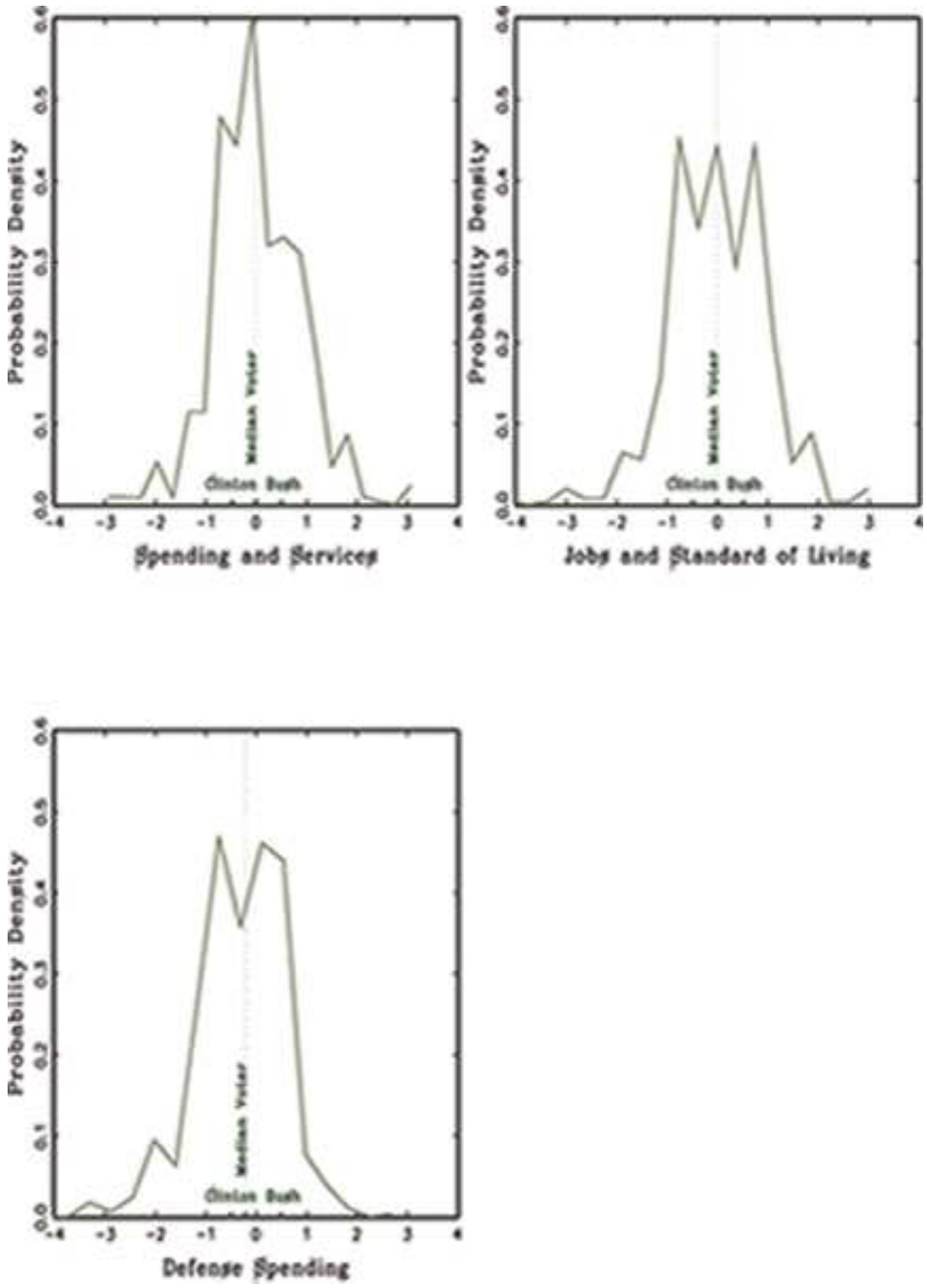
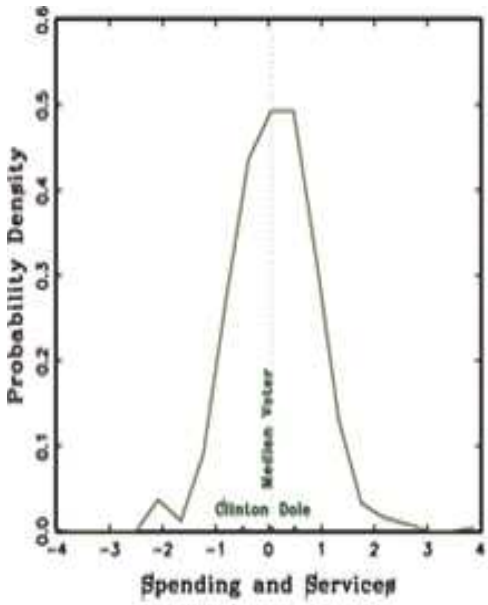
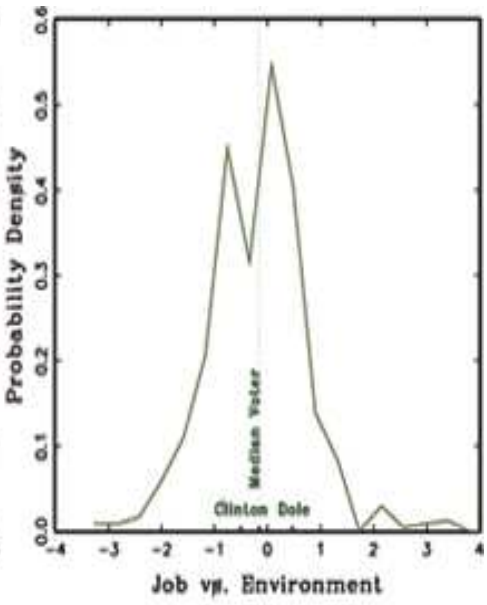


Figure 4.2. Distribution of Scaled Ideal Points and Candidate Positions, 1996





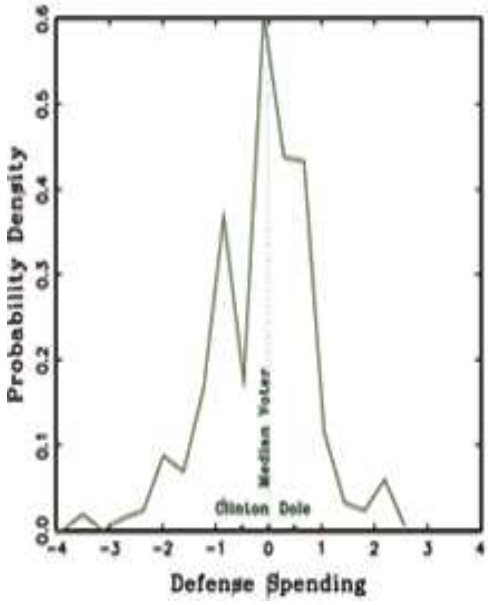
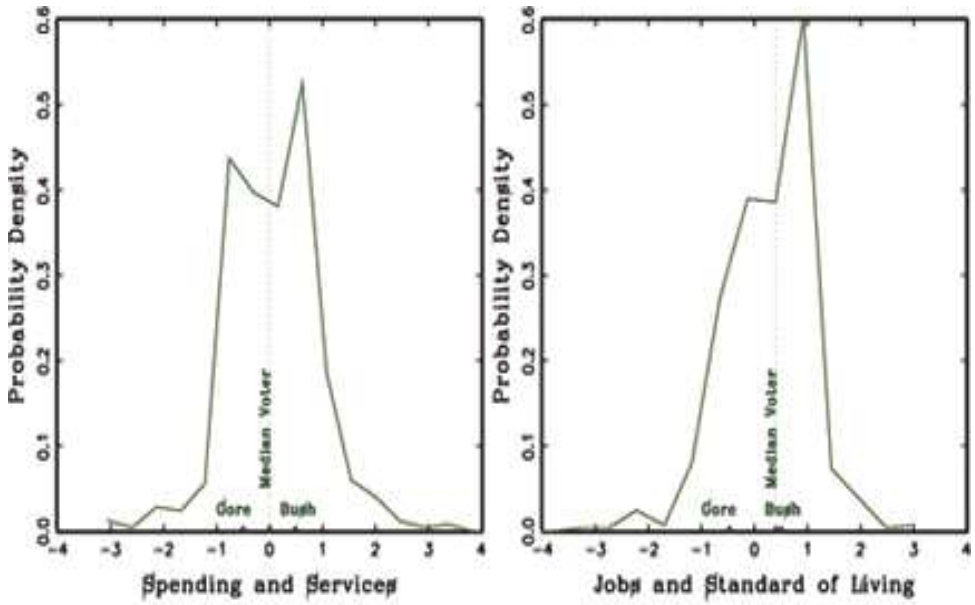


Figure 4.3. Distribution of Scaled Ideal Points and Candidate Positions, 2000



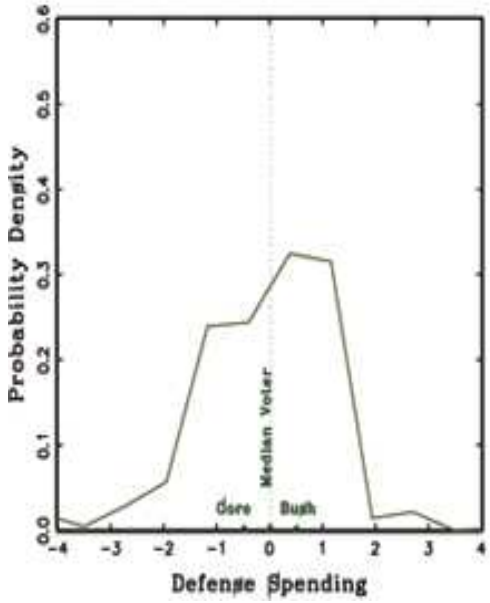
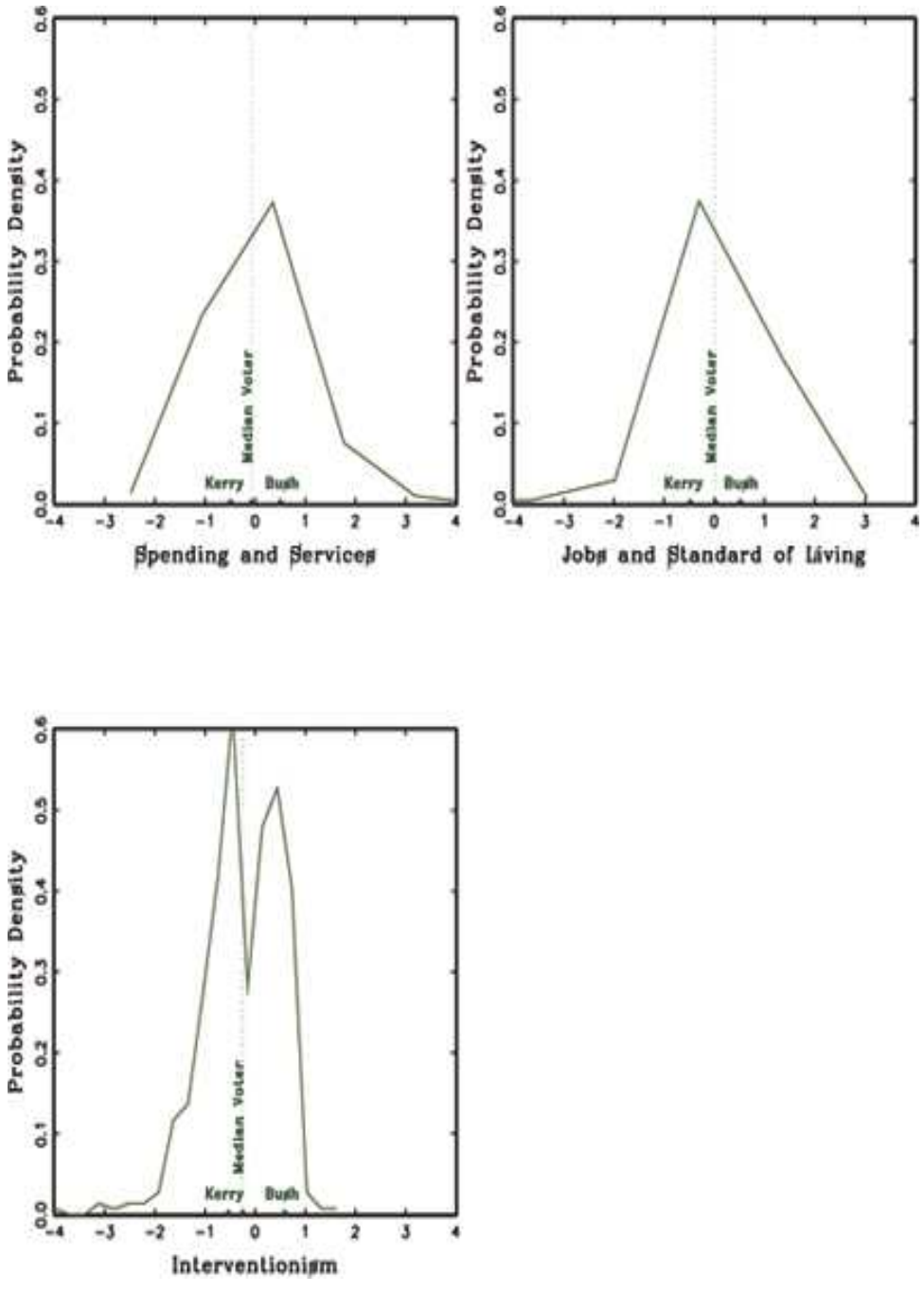


Figure 4.4. Distribution of Scaled Ideal Points and Candidate Positions, 2004



With respect to the proximity between the candidates and the mean voters, the Democratic candidates appear to have enjoyed substantial advantages on foreign policy issues, including *defense spending* and *interventionism*. To a large degree, the average citizen tends to prefer the Democratic stand of decreasing defense spending. Similarly, on the interventionism dimension in 2004, the average citizen appears to be much closer to Kerry than to Bush, meaning that ordinary people prefer using diplomacy to using military force to solve international problems. These results show, although conventional wisdom suggests that the Republicans own these national security-related issues (Petrocik, 1996; Petrocik et al., 2003), those issues were promoted more effectively by the Democratic candidates during these campaign periods. On another GOP-owned issue, the issue of *government spending and services*, the average voters were more neutral than they were on the foreign policy issues or other domestic issues, except for in 1996 when the average voters were closer to Dole than to Clinton.

On the issues that are considered Democratic-owned, Democratic candidates do not appear to have a clear advantage from *jobs and standard of*

living, but they gained tremendous support on environmental issues in 1996. The issue of *jobs vs. environment* appears to have enhanced Clinton's evaluation because the average voter favors improving environmental quality over jobs. On the other hand, on *jobs and standard of living*, which has traditionally been believed to benefit Democrats, no Democratic candidate appears to have succeeded on that basis from 1992 to 2004. In particular, the voters in 2000 tended to turn toward much more conservative positions on this issue. This may reflect a reaction against Clinton's "excessive welfare-ism" (Macdonald and Rabinowitz 2002: 7).

As for the positions of the presidential candidates and their parties, while the candidates and their parties, as a whole, are located in similar positions, they show considerable gaps on some issues. Particularly in 2004, when both Kerry and Bush were located in much more extreme positions than their parties on the issue of *interventionism*. This extremity reflects the atmosphere of 2004, which was polarized, especially on the issue of war on Iraq. The polarized candidate positions may have helped the voters remain unambiguous and more certain about

their preferences once exposed to an information source or mobilized; while, otherwise, remaining uninformed and uncertain.

So far, I have examined the general overall characteristics of American voters' opinion and their perceptions of the candidates on three salient issues of the presidential elections in 1992-2004. Of major interest in this chapter is how those characteristics vary with information and political activity. I expect the disparity in those characteristics to result in the heterogeneity in voter uncertainty in the end. I examine the disparity in the following section.

4.2 Heterogeneity in Public Opinion and Candidate Perceptions

This study assumes that different levels of information and political involvement cause discrepancies in voter uncertainty. I suggest that the most critical reason for this discrepancy is that the less informed/involved are not as successful as the more informed/involved in both conceptualizing their own issue concerns and figuring out the candidate positions. If they were unable to

understand the issues and uninformed about the candidate positions, voters would certainly have a greater uncertainty regarding their vote choices.

In this section, I compare the more and less informed and the more and less active in the two elements mentioned above: issue conceptualization and perceptions of candidate positions. For a simple comparison between the informed and the uninformed, and the more involved and the less involved, I divided the sample by individual levels of information and campaign activity.[15] As discussed in Chapter 3, I created the information index based on the correlation between the voter-reported candidate/party positions and the true candidate/party positions recovered by the Aldrich-McKelvey scaling method. The two information groups are split by the median value of the index. With respect to the level of campaign activity, the low activity group in each year

[15] The samples used in this study include only the respondents who could locate both candidates and both parties on all the three issue dimensions. Because of this, the overall levels of information and activity in this sample are expected to be higher than those in the complete sample. However, this does not cause any bias in the comparison between the groups. Because the "Don't know" respondents who are excluded from the analysis are assumed to be neither informed about nor involved in politics, if all the respondents were included, the discrepancy between the groups would be more apparent.

contains those who were involved in no campaign activity except voting, whereas the high activity people—in addition to voting—were involved in one or more campaign activities.

4.2.1. Public Opinion by Information and Activism

One source of uncertainty in spatial voting choice is the difficulty that less-informed voters face in understanding the issues and conceptualizing their concerns on those issues. Campbell et al., (1960) and Converse (1964) and their followers have revealed that voters are different in ideological conceptualization, which means “articulation of abstract (ideological) lines along which their specific political beliefs are organized” (Converse 1964: 228). According to Campbell et al., only full- or near-ideologues, who focus on their own ideology or on the party aligned by their ideological stands, can conceptualize their issue concerns. Evidence has suggested that more informed people than less informed people tend to be more polarized in their issue positions according to their ideological stands, and exposure to information increases and reinforces this

extremity of attitudes (Alvrez and Franklin 1994; Glasgow 1999; Judd and Lusk, 1984; Linville, 1982; Linville and Jones, 1980; Sniderman et al. 1991; Tesser and Leone, 1977; Zaller, 1992). Whereas more informed individuals' ideal points are distributed at more ideologically aligned locations, less informed individuals tend to place themselves on more moderate locations. This tendency reflects the cognitive difficulty that the less informed face and their lack of interest in the campaign issues.

Table 4.5. Ideal Points on Spending & Services by Information and Activism, 1992-2004

Years	Information Level		Activity Level	
	Low	High	No Activity	One or More
1992	-.047 (.886)	.115* (.816)	-.059 (.836)	.093* (.863)
1996	.134 (.822)	.139 (.765)	.079 (.698)	.186 (.865)
2000	-.029 (.927)	.203** (.834)	.111 (.980)	.070 (.817)
2004	.074 (1.868)	.060 (.845)	.014 (.841)	.089 (1.634)

Standard deviations are in parentheses.

Difference tests: *** $p<0.001$; ** $p<0.01$; * $p<0.05$; two-tailed tests.

Table 4.5 exhibits both the more and less informed and active voters' mean ideal points on *spending and services*, which is commonly salient among the ANES survey respondents in the 1992–2004 presidential elections. The differences in the expected values do not seem to be sufficient to claim the effect of information and political activism on public opinion. Only in 1992 and 2000 were the less informed respondents' positions different from those of the more informed and only in 1992 were the active different from the inactive. On all other issues, whose results are reported in Table 4.5-A1 through Table 4.5-A4 in the Appendix, the more and less informed and the more and less active are not really differentiated with their mean ideal points. Particularly in 2004, neither information nor activism appears to have changed the mean opinions among American voters on any issue.

However, because of the possibility that the mean values cancel out the opinions positioned in the both extremes, I also examine opinions of the more and less informed/active voters classified by their ideologies and see whether a higher level of information induces a more ideologically aligned position. .

Table 4.6. Ideal Points on Spending & Services by Ideology, Information and Activism

Years	Ideology	Information Level		Activity Level	
		Low	High	No Activity	One or More
1992	Liberal	-.379 (.520)	-.354 (.668)	-.364 (.906)	-.354 (.675)
	Moderate	-.148 (.874)	-.040 (.717)	.066 (1.033)	-.013 (.927)
	Conservative	.378 (.946)	.716 (.621)	.216 (.905)	.588 (.890)
1996	Liberal	-.359 (.665)	-.521 (.621)	-.320 (.590)	-.498 (.705)
	Moderate	.025 (.678)	.166 (.611)	.011 (.709)	.101 (.698)
	Conservative	.455 (.741)	.629 (.597)	.332 (.661)	.555 (.739)
2000	Liberal	-.471 (.784)	-.437 (.786)	-.348 (.867)	-.413 (.840)
	Moderate	-.119 (.588)	.247 (.825)	-.101 (1.026)	-.092 (.496)
	Conservative	.199 (.979)	.595 (.598)	.344 (1.037)	.344 (.721)
2004	Liberal	-.568 (.854)	-.632 (.530)	-.470 (.627)	-.538 (.742)
	Moderate	-.115 (.827)	-.180 (.691)	.237 (2.680)	-.105 (.936)
	Conservative	.491 (.891)	.695 (.724)	.378 (.866)	.629 (.887)

Table 4.6 demonstrates the mean ideal points of the more and less informed/active voters on *spending and services*, sorted by their ideology. It is

evident that the more informed and the more active place themselves in more ideologically aligned positions. With only a few exceptions, both liberals and conservatives tend to be farther from the center when they are more informed and more active than when they are less so. Conservative voters show this tendency to a much greater degree. This result confirms the argument that the more informed have more ideologically conceptualized opinions. If voters cannot conceptualize their concerns on the issues associated with vote choice, they should obviously have trouble in choosing their own positions as well as perceiving candidate positions, and as a result, in calculating the issue proximity. Hence, heterogeneity in issue conceptualization is certainly a reason for inconsistency in voter uncertainty among individuals.

4.2.2. Variability in Candidate Positions by Information and Activism

As discussed above, researchers have found that less informed voters tend to place candidates at the midpoints of issue scales. They argue that this phenomenon occurs because uncertain respondents guess rather than because they

have a clear perception of the candidates on those positions. Guessing may generate a greater variation than informed perceptions do in individual responses on candidate positions. Therefore, a greater variability in perceived candidate positions is expected in the responses of the less informed and the less active. According to Franklin (1991), who models the heteroskedasticity of the perceptions of candidates, campaign-induced information increases or decreases the clarity of voter perceptions and thus engenders heterogeneity in voter perception.

Table 4.7 demonstrates the recovered positions of the two major candidates and the variations for less and more informed/active voters on the issue of *spending and services*.[16] The recovered candidate positions do not appear to be distinct between more informed/active and less informed/active voters. The candidates are perceived by all voters at nearly the same positions.

[16] The recovered candidate positions and their standard deviations for the all issues employed in this study are provided in Table 4.7-A1 through Table 4.7-A4 in the Appendix.

Table 4.7. Estimated Candidate Issue Positions on Spending & Services by Information and Activism, 1992-2004

Years	Candidates	Information Level		Activity Level	
		Low	High	No Activity	One or More
1992	Clinton	-.481 (.297)	-.481 (.194)***	-.487 (.253)	-.477 (.224)***
	Bush	.492 (.301)	.495 (.193)***	.499 (.265)	.491 (.217)***
1996	Clinton	-.490 (.286)	-.486 (.231)***	-.481 (.283)	-.492 (.214)***
	Dole	.488 (.295)	.489 (.231)***	.485 (.293)	.495 (.209)***
2000	Gore	-.480 (.336)	-.498 (.230)***	-.491 (.290)	-.495 (.255)**
	Bush	.461 (.355)	.489 (.242)***	.471 (.309)	.491 (.266)***
2004	Kerry	-.500 (.180)	-.501 (.183)	-.501 (.200)	-.500 (.172)***
	Bush	.494 (.316)	.509 (.251)***	.519 (.297)	.497 (.268)*

Standard deviations are in parentheses.

F-ratio tests: *** p<0.001; ** p<0.01; * p<0.05

However, the variations of each candidate position on this issue are quite different between less and more informed voters and between less and more active voters. Except for Kerry's position in 2004, the F ratios for the variances[17]

[17] The ratio of sample variances $F = s_x^2 / s_y^2$ follows the F distribution under the hypothesis that $\sigma_x^2 = \sigma_y^2$

among these heterogeneous groups are all highly significant, indicating that as information and political involvement decreased, variances increased. This is true for all three issues in each year (see Table 4.7-A1 through Table 4.7-A4 in the Appendix). This difference between more- and less- informed/active voters in the variation of the perceived candidate position is a key feature that leads the voters to be heterogeneous in their uncertainty regarding vote choice.

This voter heterogeneity in the variability of candidate perceptions is confirmed with a survey item presented in the 1996 ANES survey. The 1996 ANES respondents were asked, after each seven-point placement of the candidate, to answer a three-point ordinal scale question designed to examine their feelings of uncertainty about the positions of the specific candidate: *How certain are you of BILL CLINTON'S (BOB DOLE'S) position on this scale? Very Certain, Pretty Certain, or Not Very Certain?* This survey item exposes a subjective uncertainty that the respondents feel on the candidates. I expect that different levels of information and political activism also induce variability in this feeling of uncertainty.

Table 4.8. Uncertainty on Positions of Clinton by Information and Activism (%), 1996

	Information Level		Activity Level	
	Low	High	No Activity	One or More
Spending & Services	13.54	9.86	15.91	8.12
Job vs. Environment	25.00	17.25	23.86	18.83
Defense Spending	20.49	21.83	22.73	19.81

Table 4.9. Uncertainty on Positions of Dole by Information and Activism (%), 1996

	Information Level		Activity Level	
	Low	High	No Activity	One or More
Spending & Services	20.83	10.21	21.21	10.71
Job vs. Environment	34.38	24.30	32.58	26.62
Defense Spending	27.87	17.61	28.90	17.53

Tables 4.8 and 4.9 exhibit the proportions of the respondents who said that they were not very certain about the positions of Clinton and Dole, respectively. The respondents were spilt by the levels of information and activism on each of

the three issues in 1996.[18] The two tables show that the more informed and the more politically involved felt less uncertain about candidate positions than those who were less informed and involved.

One notable thing here is that the discrepancy between different levels of information and activism appears more clearly for Dole's positions than for Clinton's. Researchers have found that voter uncertainty is greater for challengers than for incumbents (Alvrez 2001; Alvarez and Franklin 1994; Enelow and Hinich 1984-a). Tables 4.8 and 4.9 now reveal that the difference in voter uncertainty between the heterogeneous information groups is also greater for the challenger than for the incumbent. This result implies that the inconsistency in uncertainty regarding vote choice would be associated more with the inconsistency in uncertainty about challengers' positions than about incumbents.

[18] The marginals of all three scales are available in the Tables 4.8-A and 4.9-A in the Appendix.

4.3 Correctness of Vote Choice by Information and Activism

I have shown that issue conceptualization and variations in candidate perceptions vary with information and political activism. This inconsistency is expected to directly affect the heterogeneity of uncertainty in vote choice. I assume that, because more informed and involved American voters better conceptualize their concerns on the campaign issues and are more certain about the candidates, they would be able to vote more correctly than their less informed and involved peers. The error variance of the voting model is expected to increase as more voters fail to vote correctly. If an empirical finding discloses that the informed and politically involved make more correct decisions, it will provide an empirical justification for incorporating information and political activism in the spatial model to explain the heterogeneity in correctness of voting, that is, the level of uncertainty of voting.

Tables 4.10–4.12 present the proportions of voters who voted correctly. In a basic spatial voting model, assuming that voters make choices based on their proximity calculations, correct voting simply means that a voter selects the

candidate whose policy positions are closest to his or her own positions. In an extended spatial voting model that includes non-policy considerations as explanatory factors, a correct voting decision means the choice which would have been made under informed conditions given certain information sources,[19] regardless of how the voters weight those sources. For instance, with candidate issue information and party cues, a vote is considered correct only if a voter voted for the candidate closer to himself either in the issue positions or in the partisan stand.

Table 4.10 displays the proportions of voters who voted correctly in each sub-sample when only issue proximity is considered. Tables 4.11 and 4.12 illustrate the effect of additional information, or information cues, on this

[19] This concept is borrowed from Lau and Redlawsk (1997). Fundamentally, their concept is that it is a correct vote choice if a vote is "made of the candidate for whom the voter should vote, given his own political preference and the differential candidate information to which he is exposed" (589). In the specific method, while Lau and Redlawsk employ the concept of the on-line type of information process, I do not. The authors calculate mean (summary) evaluations (preferences) of each candidate with the given voting criteria, and if a voter votes for the candidate with the highest average evaluation, they regard it as a correct vote decision. But in my study, I rely on whether the voters vote for the candidate that they prefer in relation to any of the voting criteria, instead of calculating average evaluation.

correctness. Table 4.11 exhibits the proportions of correct voting when partisanship and proximity are taken into account, and Table 4.12 demonstrates those proportions with the candidate leadership cue added.

Table 4.10. Correct Voting based on Issue (%)

Year	Information Level		Activity Level	
	Low	High	No Activity	One or More
1992	80.4	92.5***	83.1	88.5*
1996	76.7	93.7***	79.9	89.6**
2000	79.3	93.8***	84.1	88.3
2004	85.4	94.7**	81.9	93.4***

Difference tests: *** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

Table 4.11. Correct Voting Based on Issue or Party (%)

Year	Information Level		Activity Level	
	Low	High	No Activity	One or More
1992	84.9	93.7***	85.8	91.4*
1996	81.3	94.4***	82.1	92.8***
2000	81.8	94.7***	86.9	89.5
2004	86.7	94.6**	82.1	94.1**

Difference tests: *** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

Table 4.12. Correct Voting Based on Issue, Party or Candidate (%)

Year	Information Level		Activity Level	
	Low	High	No Activity	One or More
1992	87.2	94.6**	87.4	93.0*
1996	84.8	95.4***	85.9	93.8**
2000	84.2	95.1***	84.5	93.5**
2004	91.7	95.4	86.4	96.5**

Difference tests: *** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

Consistent with expectation, the differences in the proportions of correct voting between the more and the less informed and between the more and less politically involved are sizeable. Except for three of twenty-four cases, all the differences between the heterogeneous groups are statistically significant. As for the relative effects of information and activism, the effect of information appears to be more apparent than that of activism, except for 2004 when the mobilization efforts played a more important role than in the other years (Holbrook, 2004; Jacobson, 2006). When only proximity is considered, the average difference in correctness of votes between the two different information groups is around 13%.

Once other cues are considered in addition to proximity calculations, voter uncertainty is reduced to some degree among both the more and less informed/active. The partisanship and candidate leadership cues, however, could not purge the effects of information and activism. That is, despite their success in reducing voter uncertainty, to a certain extent, those cues could not eliminate the inconsistency that the different levels of information and political activity produced. The decreased differences between the heterogeneous groups do not seem to be significant. This means that those with less information and the less involved use various information cues; but not as much as they should, to make informed decisions. Only the less informed in 2004 appear to successfully reduce their uncertainty to the same degree as the informed using the leadership cue.

4.4 Discussion

In this chapter, I have observed that American voters are not consistent in their opinion about campaign issues, perceptions of the candidates, and certainty about their vote choices. I argue that voter heterogeneity in both candidate

information and political activism are the most critical factors influencing this inconsistency. Section 4.2 shows that the levels of information and activism differentiate voters in conceptualizing their own issue concerns and in the variability regarding candidate issue positions. The more informed and the more active are more likely to place themselves on ideologically-aligned positions and be less variable in their perceptions of the candidates. This discrepancy in their conceptualizations and perceptions leads a significant proportion of voters to not vote in the way that well-informed voters do. Less informed and less active voters are more uncertain about their vote choices than more informed and more active voters. The findings of Section 4.3 also briefly show that additional information cues are insufficient to clear this heterogeneity.

Given the inconsistency in voter uncertainty influenced by information and political activism, an adequate voting model should take into account this heterogeneity. As discussed in Chapter 3, however, the standard probit model has no room to accommodate the error variances that are inconsistent across individuals. The standard probit estimations simply assume that the variance of

the probability function of vote choice is constant. This assumption infers that all voters have the same level of uncertainty regarding candidates.

Table 4.13. Probit Analysis of Vote Choice of the NES Respondents, 1992-2004
Dependent Variable: Vote Choice (1: Republican Candidate)

Independent Variable	Year			
	1992	1996	2000	2004
Intercept	-1.838*** (0.223)	-1.618*** (0.203)	-2.037*** (0.246)	-1.981*** (0.306)
Spatial Proximity	-0.169*** (0.029)	-0.188*** (0.029)	-0.129*** (0.031)	-0.148*** (0.035)
Partisanship	0.385*** (0.049)	0.368*** (0.046)	0.451*** (0.056)	0.441*** (0.070)
Candidate Leadership	0.645*** (0.094)	0.575*** (0.092)	0.745*** (0.103)	0.703*** (0.119)
N	630	570	566	487
Log Likelihood	-127.741	-126.164	-102.425	-74.002
LR Test: χ^2	590.86***	537.85***	578.60***	525.39***

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

Table 4.13 displays the probit estimations of vote choice in the 1992–2004 presidential elections. The model hypothesizes that vote choice is a function of

issue proximity, partisanship, and voter perceptions of candidate leadership. The estimates of the three explanatory variables are all strongly significant in the four election years. However, as discussed, these estimations are expected to be inconsistent because the model is estimated under an unrealistic assumption regarding the variance, which, in reality, is not constant across the voters. If some voters are more uncertain about the candidates than others, they may not vote in the way that the candidates hope they will.

In this vein, the constant and varying error variances have different implications from the candidates' strategic perspectives. When voter uncertainty is not constant across individuals, the candidates may have to find different ways to attract both the voters who know their strategic positions and those who do not. In the next chapter, using the voting choice model that incorporates my expectation about heteroskedasticity, I estimate the effects of information and activism on voter uncertainty. The estimation is expected to prove that voter uncertainty is variable according to individual levels of information and political involvement.

CHAPTER 5

Information Heterogeneity and Spatial Voting in the U.S. 1992–2004

In the previous chapter, I demonstrated that heterogeneity in information and political activism is a reason for the discrepancy in issue conceptualization and the variability of voters' perception of candidates. Numerous empirical studies have discovered that, because more informed voters can conceptualize their own issue concerns and have more consistent and precise perceptions of candidates, they are better able to evaluate the candidates on the basis of their policy positions than their less informed peers. Many have noticed that this disparity between more- and less-informed voters ultimately produces different probabilities of candidate support among voters. In addition to this indirect effect of information on vote choice by conditioning the electoral impact of issue considerations, scholars of political information have also detected a wide variety of linear or non-linear and direct or indirect information effects in relation to vote choice.

No study, however, has been interested in an important way that information affects vote choice - through its influence on voter uncertainty. Different vote choice may be attributable not only to the different weight that heterogeneous voters attribute to voting criterion but also to their different degrees of uncertainty regarding vote choice. It is highly likely that the voters who are unable to conceptualize policy issues and have inconsistent perception of candidates discern less clearly the differences between the candidates and thus have a harder time to make choice.

The most critical reason for the scholarly indifference to the effect of information heterogeneity on voter uncertainty is that, as discussed earlier, studies on information heterogeneity and studies on voter uncertainty fall within different scholarly traditions. To unify these two distinct traditions, I challenge the basic assumption of the spatial theory that uncertainty about vote choice is randomly distributed and assume that information heterogeneity causes disparities in voter uncertainty. As I have already shown in Chapter 4, more and less informed and more and less active voters differ in not only opinion distribution and the

variation of candidate perception but also in the correctness of voting decisions. Because voter uncertainty is assumed to be nothing else than the error variance of vote choice, the disparity in correctness of vote choice, though it is measured in a relatively elementary manner, strongly supports my expectations about heterogeneity in voter uncertainty.

This chapter models this expectation using the heteroskedastic probit voting model and estimates the effect of candidate information and political activism on uncertainty, along with the effects of several factors explaining vote choice. Section 1 of this chapter estimates the proximity-based heteroskedastic probit voting model to test the hypothesis of heteroskedasticity in issue voting. As seen in the previous chapter, because information heterogeneity causes variations in how voters conceptualize issue concerns and perceive candidates, it is expected to have a strong effect on uncertainty in issue voting that relies only on proximity calculations.

Nonetheless, empirical regularities of American voting behavior suggest that policy preference alone is not enough to specify electoral choice for

American voters. Voters integrate various factors into their voting decisions. The most salient among those factors are partisanship and candidate characteristics, in addition to policy preferences. One significant implication of partisanship and candidate characteristics is that they are used as information cues to help voters make correct decisions. Partisanship provides cues for guiding preferences by shaping approximate attitudes toward candidates, and candidate characteristics help voters assess how the candidates will perform in the future. Many scholars argue that those cues help individuals organize and simplify complex and confusing political phenomena. Spatial analysts have agreed that those cues help people infer informed preferences and thus randomize the error variance of the voting choice model. However, the simple analyses in Chapter 4 show that these cues cannot eliminate the effect of information heterogeneity on correctness in voting. In fact, public opinion researchers have criticized the absence of compelling evidence for the effect of information cues. In Section 5.2, I estimate the heteroskedastic probit models with partisanship and a candidate factor, in addition to issue preferences as explanatory variables, and explore whether and

how they alleviate the effect of information heterogeneity on uncertainty in vote choice. The results of the heteroskedastic probit analyses in Sections 5.1 and 5.2 are expected to warn against the pervasive assumption of equal variance in vote choice.

An underlying implication of the heteroskedasticity in vote choice is that the heterogeneous variance may eventually lead to a difference in vote choice between uncertain voters and certain voters. As long as uninformed/inactive voters and informed/active voters differ in their uncertainty about candidate preference and consequently in their voting behavior, candidates cannot ignore this variation to win votes. It is critical for the candidates to know who are less uncertain and who are more so. Section 5.3 explores the predispositions of voters that make the voters more- or less-uncertain. Finally, Section 5.4 concludes this chapter with a short discussion of the implications of the findings.

5.1. Heteroskedastic Probit Estimation: A Proximity Voting Model

Based on the distance between the recovered positions of candidates and voters, I estimate a proximity-based heteroskedastic probit voting model in this section. This model estimates the effect of spatial proximity on vote choice with a variance equation that carries information and political activism as the covariates. The variance function of this heteroskedastic probit model estimates the net effects of information and activism on voter uncertainty regarding candidate policy positions, whether the uncertainty is due to the difficulty of perceiving true candidate positions or to voters' non-policy considerations.

The estimates of the heteroskedastic probit model are reported in Table 5.1. As expected, the spatial proximities in all four years are highly significant and negative, indicating that the closer a voter is to a candidate's position, the higher his/her probability of voting for the candidate.

With respect to the variance equation, information and political activism are statistically significant in the right direction. In all four elections, it appears that higher information and participation decreased uncertainty in vote choice.

Table 5.1. Heteroskedastic Probit Analysis of Vote Choice of the NES Respondents, 1992-1996: Proximity Model

	Heteroskedestic Probit Estimates			
Independent Variable	1992	1996	2000	2004
Intercept	-0.108** (0.037)	0.044 (0.034)	0.044 (0.030)	0.023 (0.026)
Spatial Proximity	-0.155*** (0.036)	-0.172*** (0.031)	-0.126*** (0.033)	-0.125*** (0.033)
	Log (σ^2)			
Political Activism	-0.161** (0.058)	-0.245** (0.088)	-0.150* (0.070)	-0.450*** (0.073)
Information Index	-0.866*** (0.250)	-0.758*** (0.211)	-1.128*** (0.321)	-1.154** (0.380)
N	664	572	543	494
Log Likelihood	-227.727	-212.383	-198.964	-144.411
LR Test of Log (σ^2): χ^2	24.09***	29.05***	32.39***	49.86***

Dependent Variable: Vote Choice (0: Democratic candidates; 1: Republican candidates)
Standard errors are in parentheses.
*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

This result implies that, as long as the voters are heterogeneous in information and activism, considerable portions of voters should be more uncertain about their preferences than others and have trouble making decisions based on the campaign issues. Although candidates strategically position issues and manipulate voter

perceptions, if voters do not vote in the way that the candidates hope they will, the candidates may have trouble with uncertain voters. In this vein, the impact of voter heterogeneity on uncertainty about issue-based voting preference will provide an important implication for candidates' issue strategies.

The comparison of this initial observation with results from extended voting models in the next section can disclose whether and how the role of information and political activism changes as the battleground of a campaign is diversified to non-policy issues.

5.2 Heteroskedastic Probit Estimations: Extended Voting Models

This section explores the effects of information and activism on voter uncertainty using the heteroskedastic probit model, but with additional covariates in the choice equation. With two prevalent information cues, I estimate two separate heteroskedastic probit models. Model 1 estimates the effects of partisanship, in addition to issue proximity, on vote choice, as well as the effect of information and activism on voter uncertainty. In Model 2, the choice equation is

specified by an additional covariate, candidate leadership, to see whether an additional cue helps eradicate the heterogeneity in voter uncertainty.

Table 5.2. Heteroskedastic Probit Analysis of Vote Choice of the NES Respondents, 1992

Heteroskedestic Probit Estimates		
Independent Variable	Model 1	Model 2
Intercept	-1.621*** (0.296)	-1.257*** (0.282)
Spatial Proximity	-0.162*** (0.031)	-0.122*** (0.031)
Partisanship	0.360*** (0.067)	0.261*** (0.060)
Candidate Leadership		0.523*** (0.100)
	Log (σ^2)	
Political Activism	-0.054 (0.049)	-0.178** (0.071)
Information Index	-0.242 (0.189)	-0.262 (0.227)
N	663	626
Log Likelihood	-167.017	-123.627
LR Test of Log (σ^2): χ^2	3.00	7.96*

Dependent Variable: Vote Choice (0: Clinton; 1: Bush)

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

Table 5.3. Heteroskedastic Probit Analysis of Vote Choice of the NES Respondents, 1996

Heteroskedestic Probit Estimates		
Independent Variable	Model 1	Model 2
Intercept	-1.420*** (0.207)	-1.403*** (0.219)
Spatial Proximity	-0.148*** (0.027)	-0.149*** (0.032)
Partisanship	0.336*** (0.049)	0.317*** (0.049)
Candidate Leadership		0.464*** (0.103)
	Log (σ^2)	
Political Activism	-0.178* (0.079)	-0.167* (0.097)
Information Index	-0.351* (0.172)	-0.132 (0.178)
N	572	568
Log Likelihood	-143.665	-123.178
LR Test of Log (σ^2): χ^2	11.86 **	5.00

Dependent Variable: Vote Choice (0: Clinton; 1: Dole)

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

Table 5.4. Heteroskedastic Probit Analysis of Vote Choice of the NES Respondents, 2000

Heteroskedestic Probit Estimates		
Independent Variable	Model 1	Model 2
Intercept	-1.595*** (0.285)	-1.607*** (0.338)
Spatial Proximity	-0.125*** (0.028)	-0.106*** (0.031)
Partisanship	0.386*** (0.069)	0.354*** (0.075)
Candidate Leadership		0.618*** (0.123)
Log (σ^2)		
Political Activism	-0.126* (0.070)	-0.117 (0.092)
Information Index	-0.354* (0.213)	-0.265 (0.234)
N	540	519
Log Likelihood	-124.902	-87.711
LR Test of Log (σ^2): χ^2	8.13**	4.00

Dependent Variable: Vote Choice (0: Gore; 1: Bush)

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

Table 5.5. Heteroskedastic Probit Analysis of Vote Choice of the NES Respondents, 2004

Heteroskedestic Probit Estimates		
Independent Variable	Model 1	Model 2
Intercept	-1.363*** (0.337)	-0.980** (0.332)
Spatial Proximity	-0.136*** (0.035)	-0.086** (0.029)
Partisanship	0.348*** (0.085)	0.206** (0.075)
Candidate Leadership		0.403*** (0.121)
	Log (σ^2)	
Political Activism	-0.160* (0.079)	-0.349** (0.143)
Information Index	-0.423* (0.235)	-0.519* (0.302)
N	491	480
Log Likelihood	-97.965	-68.258
LR Test of Log (σ^2): χ^2	7.50*	10.81**

Dependent Variable: Vote Choice (0: Kerry; 1: Bush)

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

Tables 5.2–5.5 demonstrate the estimates of the heteroskedastic probit models for the respondents of 1992 through 2004 ANES presidential election surveys. As expected, partisanship and candidate leadership, as well as issue proximity, all have highly significant influences on vote choice. American voters in 1992 through 2004 tended to vote not only for the candidates closer to themselves in issue dimensions and partisan stands, but also for the candidates they perceived as having better presidential characteristics.

Regarding the variance equation, in some years, additional cues appear to reduce the inconsistency in uncertainty about vote choice between the more and less informed/active groups. Nonetheless, it is unlikely that those cues can eliminate the difference. Variances of vote choice are generally heterogeneous even with further criteria that inform voters about the campaign. As expected, different levels of information and activism appear to be the reasons for this discrepancy.

When partisanship was considered in addition to issue positions for voting decisions, less informed and less active voters in 1996 through 2004 still had a

hard time making so-called informed decisions because of their low levels of information and political involvement. Only the voters in 1992 seem to have enjoyed a cognitive benefit from the guidance provided by their partisan orientations. One possible interpretation for this 1992 result is Clinton's strategy emphasizing an economic recession caused by the Republican government and his theme of change throughout the campaign. This made voters' perceptions of the national economy the dominant determinant of vote choice in 1992 (Alvarez and Nagler 1995). The concentration of the campaign issue on economy may have helped all voters detect the difference between the two parties more easily than in any of the other years. Because of the ease and simplicity of the salient campaign issue relative to the issues of the other years, even voters who were not politically involved or who did not have enough information about candidate issue positions might have figured out the main theme of the campaign on the basis of partisan cleavage.

In the other election years, partisan considerations do not appear to have eliminated the heterogeneity of voter uncertainty, which is generated by voter

disparity in both activism and information. Less informed and less involved voters have greater uncertainty about their voting decisions.

The leadership cue yields a slightly different result. Overall, the addition of leadership information significantly reduces variations in uncertainty across the electorate. The uninformed and inactive voters in 2000 appear to have overcome their information shortfall by depending on the leadership cue to make correct vote choices. Information and activism do not have significant effects on the variance of vote choice in 2000, though the coefficients for the two variables still have the expected signs. The smallest, insignificant, χ^2 for the likelihood ratio test, confirms that uncertainty of the 2000 voters was not as uneven as the uncertainty level of other years.

The candidate leadership cue in other years, however, does not appear to completely compensate for a lack of information, particularly the kind of information obtained by activists. In 1992 and 1996, voters who were not involved in any political activity were still more uncertain than more active voters were; whereas, the voters with less information about the candidates appeared to

successfully overcome their lack of information thanks to the leadership cue. It is particularly interesting that the voters in 1992, who were not varied in their uncertainty when issue proximity and partisanship explain their vote choices, became more heterogeneous with the additional leadership cue for their different activity levels. These results imply that the candidate leadership cue appealed greatly to active voters, but not that much to inactive voters. Also in 1996, the addition of the leadership cue could not reduce the effect of activism on uncertainty. Although the likelihood ratio test for heteroskedasticity barely misses the critical point to be significant, the statistically significant coefficients for activism still show evidence of heteroskedasticity.

In 2004, I detect a stronger effect of information heterogeneity on heteroskedasticity of the voting model. When the information cue of candidate leadership is added in the choice equation, of the four years – only in 2004, is disparity in candidate information as well as political activism a reason for the unequal variance. The coefficients of information and activism are significant with negative signs. In addition, the χ^2 for the likelihood ratio test is also highly

significant. One possibility for the strong impact of information heterogeneity in the 2004 election is that the electoral context was highly polarized particularly on the issue of war in Iraq and mobilization was intensely focused on partisans. As seen in Table 4.4, Bush and Kerry were perceived to be more extreme on the issue of interventionism, which is associated with the means to solve the Iraq problem. With the deep partisan division on these issues of international relations, both candidates' strategies were to mobilize their own partisans rather than uncommitted voters (Jacobson 2006:16). The polarized campaign circumstances and these mobilization efforts may have allowed partisans to more easily and clearly distinguish the candidates than in any other year. Because partisans, more so than apathetic, uncommitted, voters, are more likely to be activists and more informed, informed and active voters in 2004 were probably more certain about their preferences than they had been in the other years, while the uncommitted voters who were out of the target of the campaign might be more uncertain compared to the other years. Consequently, the difference in voter uncertainty

between the informed/active and the uninformed/inactive is likely to be more discernible in 2004.

In sum, additional cues hardly exhaust the effects of information and activism on the uncertainty about vote choice across the electorate, even if the cues can reduce those effects to some degree. Although the effects vary with different election circumstances, it is generally true that American voters who have little information about candidates and who are uninvolved in campaigns suffer from their own uncertainty when making vote choices. The results of the heteroskedastic probit analysis show that additional information cues still fail to inform the less informed/active voters to be certain.

5.3. Predictions of Uncertainty

I have shown that disparities among individuals in levels of information and political activism lead some people to be more uncertain about their preferences. From the candidates' perspective, those uncertain voters make it difficult to expect consistent voting behavior and outcomes and thus to establish

campaign strategies. In certain circumstances, candidates may need to differentiate their strategies for different groups.

This section examines which voters are predisposed to be more certain about their preferences and which voters are apt to be less so. For this purpose, I develop and test explanatory models of voter certainty. The predictors of voter uncertainty are then compared with those of information and political activism. As the lack of information and activism causes uncertainty, the predictors of uncertainty, information and activism, are expected to be very similar but not necessarily to be equivalent. Although the effects of information and activism on voter uncertainty in the heteroskedastic probit model are not directly compared, the comparison of the predictors of those variables may provide a nice way to compare the strength of those variables' relationships with voter uncertainty.

Regarding the dependent variable of the OLS regression analysis for voter uncertainty, I employ the error variances of each voter's vote choice obtained from the heteroskedastic probit estimations. The explanatory variables of the analysis include respondents' media consumption, demographic, and some socio-

economic status factors. The measurement of each variable is described in the Appendix to Chapter 5. With no existing study on the predictors of voter (un)certainty, I make the hypothesis, on the basis of the extant literature of political information and political participation, that voters more certain about candidate preferences are those:

- who have higher income and educational levels,
- who have executive or professional types of jobs (prestigious jobs),
- who are relatively old and male,
- who live outside the South, primarily in the Northeast, and not in rural areas,
- who are neither Black nor Hispanic,
- who are strong partisans and affiliated with organizations[20], and
- who watch TV news and read newspapers more frequently.

[20] The organizations here include labor unions, associations of people who do the same kinds of work, fraternal groups such as Lions or Kiwanis, hobby clubs or sports teams, groups working on political issues, community groups, and school groups.

Table 5.6. Prediction of Certainty: OLS Regression Analysis

Independent Variable	1992	1996	2000	2004
Income	.001 (.001)	.003 (.001)*	.004 (.002)**	.000 (.002)
Education	.023 (.005)***	.015 (.006)**	.016 (.005)**	.016 (.008)*
Partisan Strength	.018 (.008)*	.031 (.008)***	.028 (.007)***	.054 (.011)***
Age	-.001 (.000)*	-.001 (.001)	-.000 (.000)	-.001 (.001)
Hispanic	-.074 (.071)	-.015 (.053)	.002 (.032)	.036 (.102)
Black	-.054 (.033)	-.045(.035)	-.021(.022)	-.053 (.029)*
Northeast	-.041(.019)*	-.019 (.020)	.003 (.018)	-.008 (.026)
South	-.014 (.016)	-.015 (.016)	-.002 (.014)	-.015 (.022)
Rural	-.010 (.018)	-.010 (.017)	N/A[b]	.013 (.025)
TV News	.006 (.003)*	.000(.003)	.001 (.003)	.006 (.004)*
Newspaper	.007 (.003)**	.007 (.003)**	.006 (.002)**	.002 (.004)*
Organizational Affiliation	.040(.015)**	.049 (.024)*	.024 (.013)*	.052 (.019)**
Executive/ Professional	.028 (.017)*	.002 (.017)	.015 (.015)	.018 (.022)
Laborer [a]	.030 (.029)	.019 (.029)	-021 (.026)	-.090 (.040)*
Female	.001 (.009)	-.012 (.014)	-.018 (.013)	-.043 (.019)*
Constant	.902 (.045)***	1.038 (.050)***	.961 (.042)***	.698(.055)***
N	512	523	448	440
R-squared	.169	.112	.170	.146

Standard errors are in parentheses. *** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

a. Occupations including Machine Operators, Assemblers and Inspectors, Transportation and Material Moving Occupations, Handlers, Equipment Cleaners, Helpers and Laborers

b. This variable has been excluded in 2000, because the survey item regarding the size of place where the interview was conducted is not available in the 2000 telephone sample.

Table 5.6 displays the results of the regression analysis of voter uncertainty for 1992–2004.[21] Not unexpectedly, education, partisan strength, the media and organizational affiliation have strong effects on different levels of voter uncertainty regarding their preferences, with the expected signs. They all promote the voters' certainty about their choices. Except for education, however, few socio-economic status or demographic factors appear to have much to do with the level of uncertainty. Household income also significantly explains voter uncertainty but only in two of the four years. Age, Black, living in the Northeast, whether the voters have more- (named executive/professional here) or less-prestigious types of jobs (laborer here) and being female are significant only in a single year. Hispanic ethnicity,[22] living in the South and living in rural areas are never associated with levels of uncertainty in all four years.

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[21] For the regression results to correspond to those of information and activism, the level of certainty, instead of uncertainty, is selected as the dependent variable in this analysis.

[22] Because Latinos are under-represented in the NES surveys, and moreover, because the samples of this study only include those who successfully located the positions of the candidates and parties, only a few Latinos were included for this regression analysis. This may or may not bias its effect on (un)certainty. The Hispanic ethnicity variable is the only case of this kind of problem.

Interestingly, how frequently the voters watch TV news appears to be less important than how frequently they read newspapers in relation to voter uncertainty. While the frequency of watching TV news has a significant effect on uncertainty in some years but not in other years, reading newspapers appears in all four years to strongly promote the voters' certainty.

Despite the variability in statistical significance of the socio-economic and demographic variables, the signs of the coefficients are generally consistent with expectations, with only a few exceptions. In particular, among significant predictors, only one coefficient – living in the Northeast in 1992 – shows an unexpected result.

Compared to the predictors of information and political activism, which are presented in Table 5.7 and Table 5.8 respectively, as expected, the predictors of uncertainty appear to be a combination of the predictors of both information and political activism.

Table 5.7. Prediction of Information: OLS Regression Analysis

Independent Variable	1992	1996	2000	2004
Income	.002 (.003)	.006 (.003)*	.004 (.005)	.003 (.003)
Education	.063 (.012)***	.057 (.013)***	.051 (.014)***	.035 (.012)**
Partisan Strength	.020 (.017)	.050 (.019)**	.045 (.020)*	.034 (.016)*
Age	-.002 (.001)*	-.005 (.001)***	-.004 (.001)**	.000 (.001)
Hispanic	-.152 (.157)	-.059 (.123)	-.014 (.090)	-.033 (.157)
Black	.042 (.073)	-.352 (.082)***	-.101 (.060)*	.041 (.045)
Northeast	.021 (.041)	-.090 (.045)*	.033 (.050)	.034 (.039)
South	-.044 (.036)	-.138 (.036)***	.043 (.038)	-.060 (.034)*
Rural	-.059 (.040)	-.002 (.040)	N/A[b]	.031 (.038)
TV News	-.001 (.007)	-.001 (.007)	.001 (.007)	-.003 (.006)
Newspaper	.013 (.006)*	.011 (.006)*	.007 (.007)	.002 (.006)
Organizational Affiliation	-.048 (.033)	-.048 (.055)	-.041 (.036)	.008 (.029)
Executive/ Professional	.053 (.038)	.073 (.039)*	.104 (.041)**	.063 (.034)*
Laborer [a]	.107 (.064)*	-.017 (.068)	-041 (.072)	-.022 (.063)
Female	-.007 (.020)	-.042 (.033)	-.072 (.036)*	-.022 (.030)
Constant	.396 (.099)***	.409 (.117)***	.422 (.116)***	.469(.085)***
N	512	523	448	440
R-squared	.162	.244	.166	.103

Standard errors are in parentheses. *** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

a. Occupations including Machine Operators, Assemblers and Inspectors, Transportation and Material Moving Occupations, Handlers, Equipment Cleaners, Helpers and Laborers

b. This variable has been excluded in 2000, because the survey item regarding the size of place where the interview was conducted is not available in the 2000 telephone sample.

Table 5.8.Prediction of Activism: OLS Regression Analysis

Independent Variable	1992	1996	2000	2004
Income	.008 (.011)	.015 (.011)	.045 (.016)**	-.001 (.013)
Education	.095 (.045)*	.087 (.047)*	.055 (.049)	.081 (.052)
Partisan Strength	.140 (.062)*	.218 (.068)***	.240 (.066)***	.362 (.073)***
Age	-.003 (.004)	-.002 (.004)	.005 (.004)	-.003 (.005)
Hispanic	-.354 (.569)	-.167 (.444)	-.003 (.302)	.967(.703)
Black	-.369 (.266)	-.105 (.294)	-.000 (.202)	-.454 (.203)*
Northeast	-.402 (.150)**	-.087 (.164)	-.040 (.169)	-.175 (.177)
South	-.070 (.130)	-.019 (.131)	-.140 (.129)	-.033 (.152)
Rural	.013 (.144)	-.084 (.146)	N/A[b]	.012 (.172)
TV News	.060 (.025)**	.007 (.024)	.005 (.024)	.057 (.025)*
Newspaper	.040 (.022)*	.049 (.022)*	.057 (.022)**	.010 (.025)
Organizational Affiliation	.497 (.122)***	.493 (.200)**	.409 (.120)***	.526 (.132)***
Executive/ Professional	.163 (.135)	.038 (.140)	-.100 (.139)	-.025 (.153)
Laborer [a]	.095 (.231)	.199 (.247)	-.161 (.242)	-.510 (.283)*
Female	.028 (.073)	-.051 (.117)	-.050 (.121)	-.185 (.134)
Constant	-.357 (.282)	-.853 (.422)*	-.909 (.390)*	-.237 (.380)
N	512	523	448	440
R-squared	.129	.071	.127	.143

Standard errors are in parentheses. *** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

a. Occupations including Machine Operators, Assemblers and Inspectors, Transportation and Material Moving Occupations, Handlers, Equipment Cleaners, Helpers and Laborers

b. This variable has been excluded in 2000, because the survey item regarding the size of place where the interview was conducted is not available in the 2000 telephone sample.

However, it is of much interest that the predictors of (un)certainty are much more similar to the predictors of political activism than to those of information. Whereas the statistically significant predictors of the information level include more of the socio-economic and demographic variables than the predictors of the uncertainty level, the predictors of political activism in each year are almost equivalent to those of uncertainty. Particularly in 1992 and 1996, when political activism has a stronger influence on uncertainty than information does, the significant predictors of uncertainty are nearly the same as those of activism but dissimilar to the predictors of information. Among the consistently important predictors of uncertainty, education, which is significant only in 1992 and 1996, is the only one whose effect is not significant in activism. On the other hand, among the key predictors of uncertainty, organizational membership is never associated with levels of information and the media's effects are even smaller in information than in uncertainty or activism.

In relation to the comparison of the predictors, it is notable that the predictors of information and those of activism are considerably different. The

level of information is more likely than the level of activism to be explained by socio-economic and demographic factors, while the level of activism is affected mostly by the strength of party identification, organizational membership, and exposure to the media. Partisan strength is the only variable that is almost consistently important for both information and activism. It is interesting that individuals who are affiliated with organizations are more politically active, but they are not better informed about the candidates than those who are not associated with organizations. Similarly, when the media significantly encouraged political participation, it does not appear to have helped voters that much to be more informed. This disparity was not expected because studies have discovered that information promotes activism, and activism, in turn, informs the citizens, and as a consequence, activists are generally the more informed. But the regression analysis above shows that the sources or characteristics encouraging activism and improving information level are different; and the level of uncertainty is more likely to be related to the sources that affect political activism.

To summarize, the results of the OLS regression analysis reveal that voters are predisposed to be more or less certain about their preferences. Voters who have ample resources, especially education, identify strongly with the parties, use the media frequently, and are well connected socially are better able to make certain choices. Notably, these factors influencing voters' uncertainty are more similar to those affecting voters' levels of political activism than to the factors affecting the level of information. Although not decisive, this result suggests that the disparities in voter uncertainty are attributable more to the disparities in activism than to disparities in information. Nevertheless, the educational level as the most important predictor of information is still a crucial variable that explains why some voters are uncertain while others are not.

5.4. Discussion

The results of the heteroskedastic probit analysis disclose that some voters are more uncertain than others regarding their vote choices. Although these results are not unexpected, they have been ignored by spatial voting analysts. Voter

heterogeneity in uncertainty, however, has important implications for spatial analysis, especially from the strategic candidate perspective. According to Lin et al. (1999), the degree of voter uncertainty is strongly related to the candidate strategy of convergence. They show that a large degree of voter uncertainty is a sufficient condition for concavity of the candidate's expected vote function and thus leads rational candidates to converge at a "minimum-sum point" at which the total distances from all voter ideal points are minimized. Conversely, they argue, a small degree of uncertainty makes an equilibrium strategy difficult.

Based on this finding, an important question about candidate strategies can be raised: What are the candidate strategies toward voters who are heterogeneous in their level of uncertainty? Can the candidates have equilibrium strategies? In his work on a Downsian spatial model with party activism, Aldrich proposes that when the electorate is divided into activists and non-activists, a stable equilibrium exists in a single dimension along the distributions of activists, which are "relatively cohesive within each party but relatively divergent between parties" (Aldrich, 1983a: 974). Similarly, Schofield and his colleagues argue that

candidates' valences generated by activists strongly affect candidates' optimal positions, which are generally chosen at the locations where activists' contributions are maximized. As Miller and Schofield (2003) state, empirical evidence from the U.S. elections that parties do not converge to the center supports activist-generated equilibria. However, Schofield and his colleagues also notice that activist-generated equilibria are not sufficient for the vote-maximizing candidates to win elections, because "activists are less concerned with winning elections than with maintaining the ideological stance of the party" (Miller and Schofield 2003: 250). To enhance their short-term prospects of winning, the authors argue, the candidates choose the policy positions where the incentives of the ordinary voters and the contributions of the activists are balanced.

This argument is quite relevant to the candidate's equilibrium strategy toward the voters who are heterogeneous in uncertainty about vote choice. It is evident that candidates have a complex optimization problem vis-à-vis certain and uncertain voters, because, as seen in Chapter 4, the uncertain voters' preferred positions are different from the certain voters' more ideologically-aligned ideal

points. As Downs argues (1957:95), it is more likely that candidates consider certain voters more important than uncertain voters because certain voters are more responsive to candidate positions and more willing to support and contribute their money and time to the candidates whose positions they favor. Nevertheless, as long as the primary purpose of the candidate is winning the election, the candidate cannot renounce uncertain voters even though the voters are less confident about their preferences and their votes are less predictable. How to balance these heterogeneous voters' opinions in the strategic locations is a crucial question for the vote-maximizing candidates to win elections.

Data from the 1992-2004 U.S. presidential elections show that the equilibrium strategies of the Republican candidates were very different from those of the Democratic candidates. Table 5.9 displays the distances between the heterogeneous groups of voters and the candidates who they voted for.

Table 5.9. Average Issue Distances between the Candidates and their Voters By Information, Activism and Uncertainty

Distances between the Republican Party's Candidates and their Voters

	Information		Activism		Uncertainty	
Year	Low	High	No Activity	One or More	Uncertain	Certain
1992 (Bush)	2.850 (6.033)	1.106** (1.671)	2.360 (5.590)	1.590 (2.473)	2.384 (5.499)	1.270* (2.170)
1996 (Dole)	2.230 (3.151)	1.081*** (1.733)	2.166 (2.894)	1.312** (2.316)	2.240 (3.189)	1.030*** (1.581)
2000 (Bush)	3.014 (5.619)	1.248*** (2.700)	2.507 (5.471)	1.505* (2.584)	2.372 (5.184)	1.264* (2.236)
2004 (Bush)	2.563 (3.909)	1.346* (4.086)	2.388 (5.606)	1.522 (2.973)	2.595 (5.452)	1.061** (1.683)

Distances between the Democratic Party's Candidates and their Voters

	Information		Activism		Uncertainty	
	Low	High	No Activity	One or More	Uncertain	Certain
1992 (Clinton)	1.945 (2.858)	1.452 (2.289)	1.849 (2.768)	1.590 (2.473)	1.911 (2.931)	1.441 (2.285)
1996 (Clinton)	2.005 (2.205)	1.938 (2.937)	1.843 (2.199)	2.117 (3.050)	2.059 (3.012)	1.879 (2.185)
2000 (Gore)	3.546 (7.691)	3.265 (7.279)	3.297 (7.179)	3.175 (7.219)	3.377 (7.216)	3.645 (8.230)
2004 (Kerry)	1.669 (2.427)	0.959** (1.827)	1.460 (2.476)	1.235 (2.044)	1.344 (2.177)	1.153 (2.128)

Standard errors are in parentheses.

Difference of means tests: *** $p<0.001$; ** $p<0.01$; * $p<0.05$; two-tailed tests.

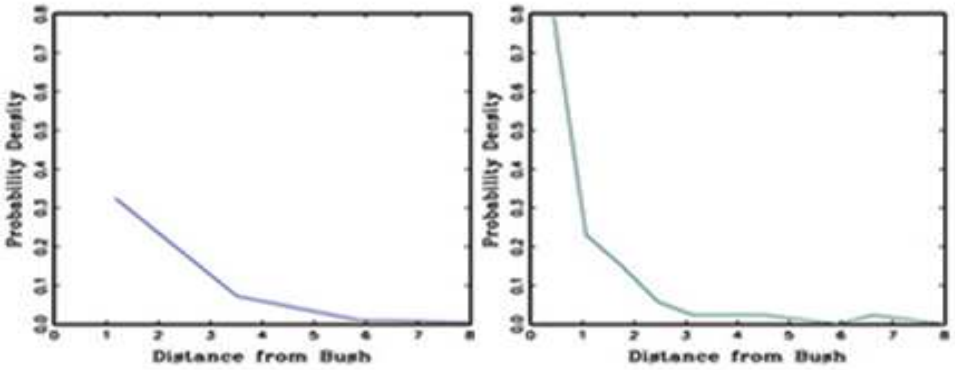
This table simply describes how close the candidates were to each group of their own voters.[23] The table shows that, while the positions of the Republican candidates were consistently closer to the positions of their certain voters than to those of their uncertain voters, the Democratic candidates, when taking positions, do not appear to have differentiated their uncertain voters from their certain voters. This tendency is confirmed when looking into the individual factors that directly affect uncertainty – information and activism. The Democratic candidates' targets were still not distinguished by the level of information or activism, whereas the Republican candidates' positions were consistently closer to the informed voters and active voters, although the mean distances from the active voters and those from the inactive voters were not statistically significant in two of the four years.

[23] This comparison may oversimplify the context around the candidates' strategies because it does not include each candidate's potential voters who were considered by the candidates when the strategic positions were taken but finally did not vote for that candidate. It only includes the voters who voted for the corresponding candidate. Nevertheless, this fact does not seem to significantly distort the tendency of the candidates' position-taking from 1992 through 2004. The tendency is pretty consistent and clear.

Figure 5.1. Distance from Candidates, by Uncertainty

Voters for Republican Candidate in 1992

Uncertain voters Certain voters



Voters for Democratic Candidate in 1992

Uncertain voters Certain voters

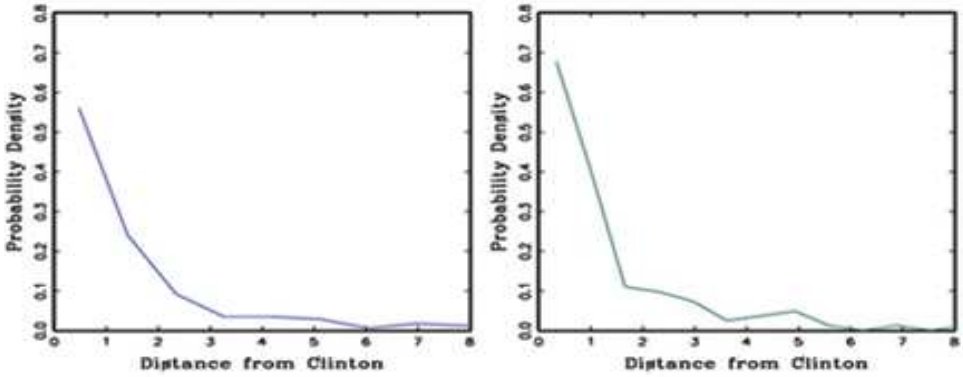
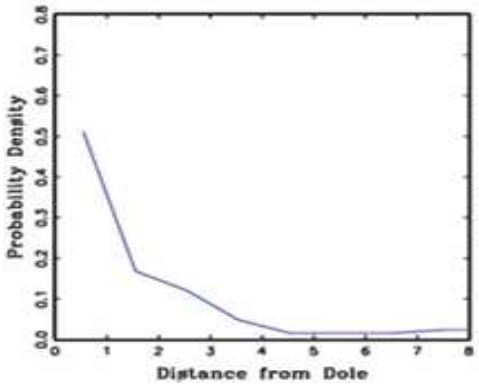


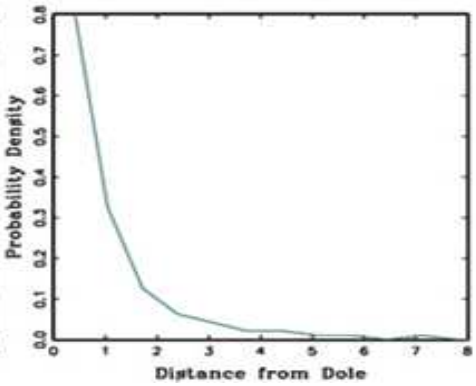
Figure 5.1. Distance from Candidates, by Uncertainty, Continued

Voters for Republican Candidate in 1996

Uncertain voters

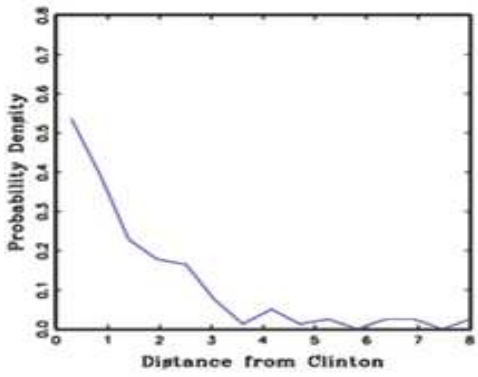


Certain voters



Voters for Democratic Candidate in 1996

Uncertain voters



Certain voters

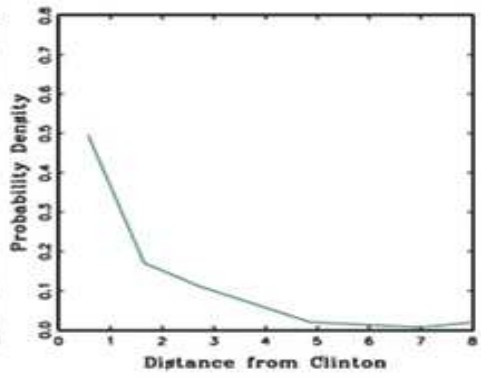
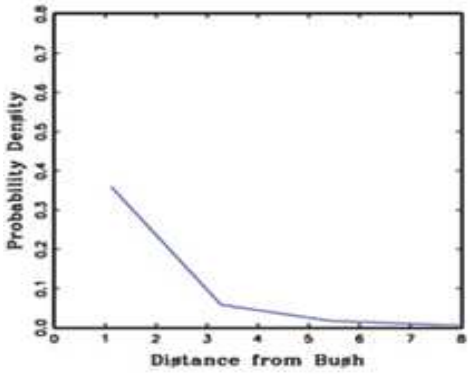


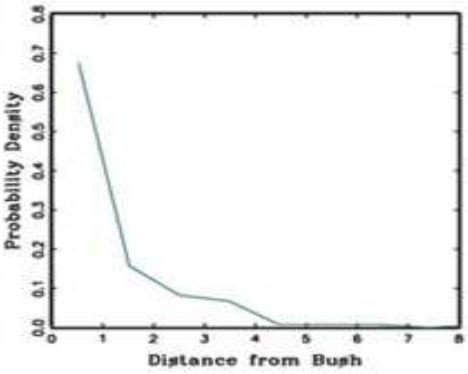
Figure 5.1. Distance from Candidates, by Uncertainty, Continued

Voters for Republican Candidate in 2000

Uncertain voters

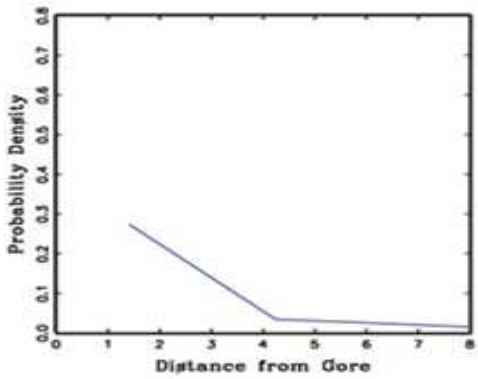


Certain voters



Voters for Democratic Candidate in 2000

Uncertain voters



Certain voters

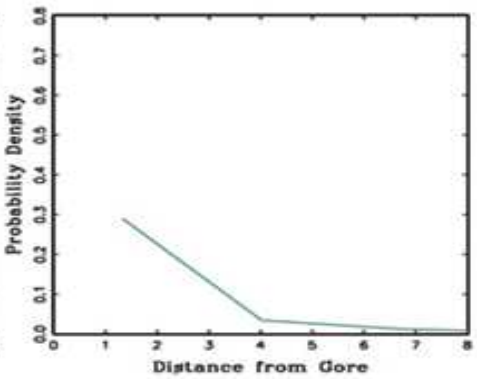
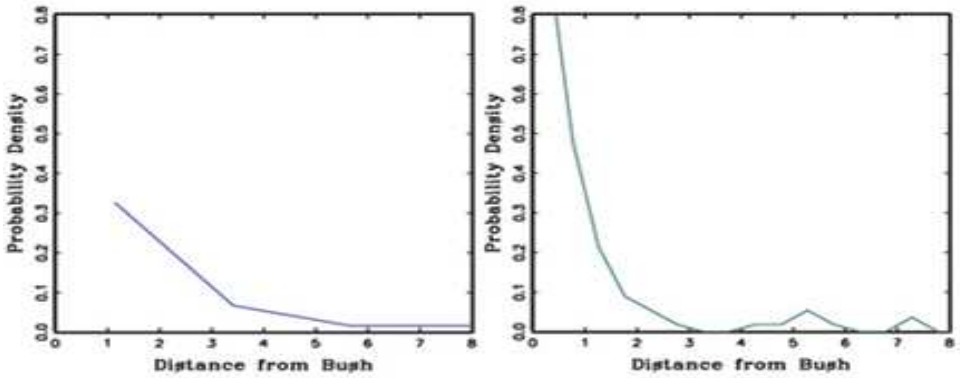


Figure 5.1. Distance from Candidates, by Uncertainty, Continued

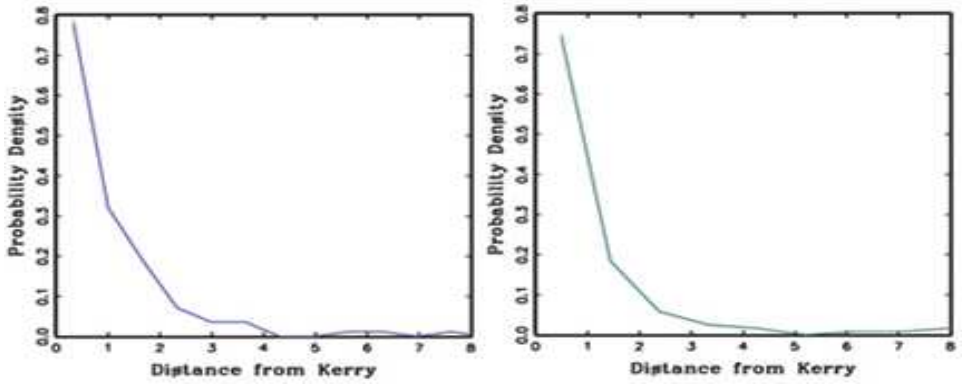
Voters for Republican Candidate in 2004

Uncertain voters Certain voters



Voters for Democratic Candidate in 2004

Uncertain voters Certain voters



The probability densities exhibited in Figure 5.1 also clearly illustrate the same tendency. These results suggest that, in 1992-2004, while the Democratic candidates were likely to take their positions at the locations which would please the certain and uncertain voters to similar degrees, the Republican candidates tended to appeal more to their certain voters; that is, those who were better educated, more strongly affiliated with their party, associated with organizations, and more exposed to the media.

It is interesting that the Republican candidates have steadily considered the certain voters more important, given the findings of previous studies that the uncertain and certain voters have different candidate preferences according to the familiarity of the candidates (Alvarez 2001; Bartels 1986; Enelow and Hinich 1984-a) but not to the candidates' partisan affiliations. In addition, it is equally interesting that the Democratic candidates have not taken into consideration heterogeneity in voter uncertainty despite the fact the heterogeneity in uncertainty led to the disparities in the voters' responses to the strategies and probably in their voting preferences. This finding suggests several questions to be explored in

further studies: What were the factors engaged in this bipartisan distinction in policy strategies towards the heterogeneous voters? That is, what were the candidates' calculus producing these strategic positions? Does the difference between the two parties' candidates in dealing with the heterogeneous voters warrant the vote-maximizing positions for each candidate? Finally, how well do the candidates' strategies embrace the certain and uncertain voters to be optimal?

Other than the equilibrium strategy, the findings of this chapter imply that campaign tactics and messages better be discriminated along with the various factors that characterize certain and uncertain groups. For better strategies and tactics, candidates need to precisely learn about those factors. For example, the conventional perception that Hispanics are less informed or less certain was not verified in the OLS regression analysis of Section 5.4. Hispanic ethnicity never appears to have to do with the levels of information, activism or uncertainty. In fact, according to Abrajano (2005), who studies heterogeneity among the Latino electorate, it was a mistake for the 2000 presidential candidates to use conventional non-policy, symbolic, campaign messages to appeal to all Latino

voters; such cues as shared ethnic identity and common language were effective only for the least-educated Latinos, but they do not work among more informed Latinos. Similarly, Nicholson et al. (2006) argue that not all Latino voters are uniformly swayed by symbolic approaches. The effect of symbols is strongest for the less informed, whereas the better informed look to issues as well as symbols when making voting decisions.

Scholars on American voting behavior also have revealed that informed voters are more likely to rely on issue positions, whereas voters with low levels of information rely heavily on more symbolic and less abstract cues (Bartle, 2000; Goren, 1997; Hamill, Lodge and Blake, 1985; Lau and Redlawsk, 2001; Sniderman et al. 1991). Political activists are more integrated with politics, are mobilized around issues (Rosenstone and Hansen, 1993), and as a result, are also expected to depend heavily on issue preferences when they make vote choices. Accordingly, certain voters are more likely than uncertain voters to rely on issue proximity for vote choice. The fact that different groups of voters tend to use different voting cues suggests that candidates should be cautious in applying

unified campaign strategies and tactics to heterogeneous groups. Certain cues or campaign tactics that are highly effective for a specific group of voters may not be effective for the other set of voters.

To this point, I have discussed heterogeneity in uncertainty among American voters. My expectation about heteroskedasticity has been strongly supported by the results of the heteroskedastic probit analysis. Having found significant levels of heterogeneity in voter uncertainty caused by information and political activism, in the next chapter, I will turn to the question of how this heterogeneous uncertainty affects electoral choices. The answer to this question provides an important implication of findings of this study.

CHAPTER 6

Electoral Consequences of Heterogeneity in Uncertainty

As the results of the heteroskedastic probit analysis in Chapter 5 demonstrate the strong effect of information heterogeneity on voter uncertainty, this chapter explores how this heterogeneous uncertainty affects voting decisions. If uncertain voters are still able to make the same decisions as certain voters, despite their lack of information and political involvement, the disparity in voter uncertainty may not have to be the main concern of the candidates. Yet if the disparity leads to systematically different vote choices, the heterogeneity in voter uncertainty will never be ignored by rational politicians.

Most spatial analysts assume that voter uncertainty is a component of disutility. A general agreement is that voters tend to discount a candidate with a certain level of uncertainty, because voters are risk-averse. A risk-averse voter would choose the candidate who has more certain positions, given two candidates with the same expected positions (Lin et al. 2007: 10). This assumption of risk

aversion is inferred from a concave utility function of the distance between the candidate's position and the voter's most preferred point.

Enelow and Hinich (1981) formulated the negative effect of uncertainty on vote choice in a concave utility model simply by adding the component of uncertainty to the squared distances between the candidate's expected positions and the voter's ideal point. In this model, voter uncertainty is assumed to directly affect vote choice in such a way that uncertainty about a candidate's positions reduces the probability that a voter will vote for the candidate. This model was improved later by Bartels (1986) to include the variations in uncertainty among individual voters as well as among candidates.

The heteroskedastic probit model used in this study also adopts the assumption of risk aversion by using a quadratic utility function. Therefore, the model basically presumes that uncertainty about perceptions of a candidate's positions has a negative effect on vote choice. While heteroskedastic probit is not formulated for uncertainty to have a direct effect on vote choice, Achen (2002) shows that heteroskedastic probit can be transformed into a formulation of

homoskedastic probit, in which the component of uncertainty is an additional factor directly affecting the dependent variable. According to Achen, if the exogenous variables affect the variance in the heteroskedastic probit model, they are also expected to have direct effects on the dependent variable. Hence, the estimated effects of information and activism on the variance provide the theoretical basis for expecting the effects of those variables, and thus the effects of uncertainty, on vote choice. As information and activism are negatively related to uncertainty, those variables should have positive effects on the probability of voting for a specific candidate while uncertainty has a negative effect on the probability.

In Section 6.1, from Achen's argument and the Enelow-Hinich formulation modified by Bartels, I derive a model inferring the effect of heterogeneous uncertainty on the probability of voting for the incumbent. With this model, I expect that voters' relative uncertainty about the challenger's positions lead the voters to vote for the incumbent. This expectation assumes the risk-averse attitudes of voters rewarding the candidate whose positions are more

certain. Section 6.2 explores the empirical evidence for this expectation. As previous studies have found that voter uncertainty is related to incumbency advantage, the data are anticipated to support the expectation that uncertain voters will be more likely to vote for the incumbent.

6.1. A Model of Electoral Choice Under Heterogeneous Uncertainty

Enelow and Hinich (1981, 1984-a) extended the deterministic spatial model to include the component of voter uncertainty that makes candidates' policy positions not points on a policy dimension but probability distributions. According to Enelow and Hinich (1981: 484-485; 1984-a: 123-124), the utility of voter i for candidate j depends on the squared distance between candidate j's position perceived by voters (P_{jk}) and voter i's most preferred position (X_{ik}) on issue k:

$$U_{ji} = -\sum_{k} (P_{jk} - X_{ik})^2 + C_{ij} \qquad (1)$$

Where $C_{ij} > 0$ is a constant representing the non-policy value of j to voter i.

Because the perceived position of candidate j is a random variable rather than a single point,

$$P_j = \pi_j + \varepsilon_j \tag{2}$$

where π_j is candidate j's true position and ε_j represents the distortion from imperfect information about the candidate's positions.

Then, voter i's expected utility for candidate j is

$$\begin{aligned} EU_{ji} &= E\{-\sum_k (P_{jk} - X_{ik})^2 + C_{ij}\} \\ &= E\{-\sum_k ((\pi_{jk} + \varepsilon_{jk}) - X_{ik})^2 + C_{ij}\} \\ &= -\sum_k \{(\pi_{jk} - X_{ik})^2 + E(\varepsilon_{jk}{}^2)\} + C_{ij} \qquad (E(\varepsilon_{jk}{}^2) = \sigma_{jk}{}^2) \\ &= -\sum_k (\pi_{jk} - X_{ik})^2 - \sum_k V_{jk} + C_{ij} \end{aligned} \tag{3}$$

where π_{jk} and X_{ik} denote the positions of the j[th] candidate and i[th] voter on issue k; V_{jk} represents the variance of the distribution of j's perceived locations on issue k. In the Enelow-Hinich model, this variance is allowed to vary across candidates and issues but not across voters.

In this utility model, voter i's expected utility for candidate j depends not only on the squared distance between candidate j's expected policy position and

voter i's ideal point on issue k but also on the degree of uncertainty about j's position. This formulation clearly presents that the error variance depresses the voter's utility for a candidate. The greater the variance of j's perceived position is, the smaller voter i's utility is for candidate j. As Bartles (1986: 709) states, this simplified and direct way of modeling how uncertainty affects vote choice is an appealing feature of the Enelow-Hinich model. However, because it assumes that uncertainty about a candidate is constant for all voters, uncertainty is likely to be a candidate's fixed characteristic. Under this fixed degree of uncertainty about a candidate, it is simply assumed that all voters are more uncertain about one candidate than another, for instance, challengers rather than incumbents (Enelow and Hinich 1984-a: 124). As discussed in earlier chapters, this is not realistic. Highly informed voters and poorly informed voters may be different in their awareness of the challenger's position as compared to their awareness of the incumbent's position.

To allow for uncertainty varying across individuals as well as across candidates and issues, Bartels (1986) modifies the Enelow-Hinich formulation. In Bartel's model, voter i's utility for candidate j is

$$EU_{ji} = -\sum_k (\pi_{jk} - X_{ik})^2 - \sum_k V_{ijk} + C_{ij} \qquad (4)$$

In an election with two candidates, j=0, 1, voter i will vote for candidate 1 over candidate 0, if and only if

$$\Pr[EU_{1i} - EU_{0i} + \delta_i > 0]$$

where $\delta_i \sim N(0, \sigma^2)$ is i's error in perceiving the difference of expected utilities. That is,

$$\Pr[Vote = 1]$$

$$= \Pr[-\delta_i < (-\sum_k (\pi_{1k} - X_{ik})^2 - \sum_k V_{i1k} + C_{i1}) - (-\sum_k (\pi_{0k} - X_{ik})^2 - \sum_k V_{i0k} + C_{i0})]$$

$$= \Phi[(-\sum_k (\pi_{1k} - X_{ik})^2 - \sum_k V_{i1k} + C_{i1}) - (-\sum_k (\pi_{0k} - X_{ik})^2 - \sum_k V_{i0k} + C_{i0})]$$

$$= \Phi[(-\sum_k ((\pi_{1k} - X_{ik})^2 - (\pi_{0k} - X_{ik})^2) - \sum_k (V_{i1k} - V_{i0k}) + (C_{i1} - C_{i0})] \qquad (5)$$

where Φ() is the cumulative distribution function (cdf) of the standard normal distribution.

This equation portrays the effect of uncertainty on the probability of choice very conveniently by considering uncertainty to be an independent variable having a direct, negative effect on the probability of voting for candidate 1 over candidate 0. Built on a concave utility function, this model implies that voters' risk-averse attitudes will reward the candidate whose positions they are less uncertain about, as long as the expected positions of the candidates are the same.

This formulation is conceptually compatible with the argument of the present study. By using a concave utility function implying risk aversion, the heteroskedastic probit model in this study infers that the degree of voter uncertainty affects voters' choices in a negative direction. Achen (2002) formulates this inference from the heteroskedastic probit formulation while he makes a critique about the model. According to Achen, the heteroskedastic probit model with the choice equation $p_i = \Phi(X_i\beta)$ and the variance equation $\sigma_i = \exp(Z_i\gamma)$ [24] is equivalent to a homoskedastic probit with explanatory variables $X_i / \exp(Z_i\gamma)$. Achen shows how this is formulated (444 - 445).

[24] Where X_i and Z_i are vectors of covariates and β and γ are vectors of coefficients.

By the Taylor series expansion,

$\sigma_i = \exp(Z_i\gamma) \approx 1 + Z_i\gamma$, where $Z_i\gamma$ is small,

that is, $\frac{1}{\exp(Z_i\gamma)} \approx 1 - Z_i\gamma +$ small higher-order terms. (6)

Assuming that

$X_i\beta = \beta_0 + X_{1i}\beta_1$, where β_0 is an intercept term,

Achen finds

$\frac{X_i\beta}{\exp(Z_i\gamma)} \approx X_i\beta - \beta_0 Z_i\gamma +$ small interaction terms in X_{1i} and Z_i. (7)

Given the fact that the interaction terms are difficult to detect, he argues that the left-hand side of this equation is "very nearly a simple linear specification in X_i and Z_i (445)." That is,

$\frac{X_i\beta}{\exp(Z_i\gamma)} \approx X_i\beta - \beta_0 Z_i\gamma$ (8)

The interpretation of this equation is that, if the standard deviation of the probit model (σ_i) is a positive function of uncertainty ($Z_i\gamma$), then it is almost equivalent to have uncertainty as an independent variable with a negative sign, assuming that the intercept term is positive. That is,

$$\Pr[Vote = 1]$$

$$= \Phi\left[\frac{\beta\sum_{k}((\pi_{1k} - X_{ik})^2 - (\pi_{0k} - X_{ik})^2)}{\exp(Z_i\gamma)}\right]$$

$$= \Phi[\beta\sum_{k}((\pi_{1k} - X_{ik})^2 - (\pi_{0k} - X_{ik})^2) - \beta_0 Z_i\gamma + \beta_0] \quad (9)$$

Equation 9, with a linear specification in distances and uncertainty, explicitly presents that uncertainty entails disutility. This equation implies that, assuming a positive sign of the intercept term (β_0), voters discount the candidate adopted as the dependent variable as a result of their uncertainty. Therefore, the substantive interpretation of this equation is consistent with that of equation 5 demonstrating the negative relationship between uncertainty and vote choice.

Because uncertainty ($Z_i\gamma$) is nothing more than the variances of voters' perceptions, from equation 5 and equation 9, the following equation is deduced:

$$\Pr[Vote = 1]$$

$$= \Phi[(\beta\sum_{k}((\pi_{1k} - X_{ik})^2 - (\pi_{0k} - X_{ik})^2) - \beta_0\gamma\sum_{k}(V_{i1k} - V_{i0k}) + \beta_0] \quad (10)$$

Where $\beta_0\gamma > 0$ is assumed.

Empirically, studies have discovered that the candidate challenging the incumbent usually has greater uncertainty associated with his policy positions (Alvarez 2001; Enelow and Hinich 1984-a). Voters have opportunities to learn about the incumbent while he is in office, whereas the voters do not have enough time to get familiar with the challenger. Therefore, it is highly likely that the electorate is more certain about the incumbent than about the challenger. In addition, as Alvarez (2001: 164-165) points out, previous electoral experience and national prominence may interact with incumbency to help make the positions of the incumbent more certain.

The argument that voters are more certain about the incumbent or the better-known candidate, however, only presumes that voter uncertainty varies across the candidates but not across individuals. It assumes that the electorate as a whole is more uncertain about the challenger than it is about the incumbent. As the present study has discovered that voter uncertainty is not homogeneous but heterogeneous across individuals, it may not be plausible to simply hypothesize that certain voters and uncertain voters have the same tendency of choice. There is

no reason to assume that certain voters are likely to vote for the incumbent over the challenger to the same degree to which uncertain voters vote for the incumbent, only because the incumbent is usually better known to the electorate.

As Sniderman et al. (1991) argue, the voters who are uninformed about the candidates would make their decisions based on whether the incumbent's performance (on economy) is satisfactory, whereas more informed voters would vote depending on both candidates' policy positions. Sniderman et al.'s argument implies that uninformed (uncertain) voters may vote for the incumbent only if they approve the incumbent president's (economic) performance, but informed (certain) voters may consider the incumbency of the candidate less. Consequently, as long as economic recession is not the dominantly salient issue, the more uncertain a voter is about the candidates' positions, the more likely he or she will be to vote for the incumbent, all other things held constant. Because voter uncertainty about the candidates' positions is most likely to result from the voter's uncertainty about the challenger's positions rather than from uncertainty about the incumbent's positions (see Table 4.8 and Table 4.9), a voter's probability of

voting for the incumbent is expected to depend on his uncertainty about the challenger. That is, as voter uncertainty about the challenger's positions increases, his probability of voting for the incumbent becomes greater. Built upon this expectation and according to Achen's formulation, equation 10 can be re-formulated as follows:

$$\Pr[Vote = incumbent]$$

$$= \Phi[(\beta \sum_{k} ((\pi_{inck} - X_{ik})^2 - (\pi_{chk} - X_{ik})^2) - \beta_0 \gamma \sum_{k} (V_{iinck} - V_{ichk}) + \beta_0] \quad (11)$$

$$= \Phi \left[\frac{\beta \sum_{k} ((\pi_{inck} - X_{ik})^2 - (\pi_{chk} - X_{ik})^2)}{\exp(\sum_{k} (V_{iinck} - V_{ichk}) \gamma)} \right] \quad (12)$$

Assuming that $\beta_0 \gamma > 0$, $\beta_0 < 0$, $\gamma < 0$, and $V_{iinck} - V_{ichk} < 0$, where *inc* and *ch* represent the incumbent and the challenger, respectively.

Equation 11 and equation 12 imply that the more uncertain a voter is about the challenger's positions - relative to the incumbent's positions -, the more likely the voter is to vote for the incumbent, other things held constant. Practically, as voter uncertainty about the challenger is a result of a lack of information and activism, equation 12 is re-formulated as follows:

$$\Pr[Vote = incumbent]$$

$$= \Phi\left[\frac{\beta\sum_{k}((\pi_{inck} - X_{ik})^2 - (\pi_{chk} - X_{ik})^2)}{\exp(\gamma_{info} I_i + \gamma_{act} A_i)}\right] \quad (13)$$

$$= \Phi[\beta\sum_{k}((\pi_{inck} - X_{ik})^2 - (\pi_{chk} - X_{ik})^2) - \beta_0(\gamma_{info} I_i + \gamma_{act} A_i) + \beta_0] \quad (14)$$

Where I_i and A_i denote voter i's levels of information and political activism, respectively; γ_{info} and γ_{act} indicate the coefficients with negative values corresponding to i's information and activism, respectively.

Equation 14 simply displays the negative relationship between information (and activism) and the probability of voting for the incumbent: the more informed and active a voter is, the less likely the voter is to vote for the incumbent, other things held constant.

In this section, I examined the theoretical models for the electoral consequences of voter uncertainty and its heterogeneity. From those theoretical models, I inferred a hypothetical model implying that, as a voter's uncertainty about the challenger's positions increases, his probability of voting for the incumbent raises. This model is consistent with the Enelow-Hinich model

modified by Bartels, and with the model formulated by Achen, in that it assumes risk-averse voters who prefer the candidate with more certainty associated with his policy positions, other things held constant. In the following section, I conduct empirical tests for this model.

6.2. Electoral Consequences of Heterogeneous Uncertainty

While it is difficult to estimate the direct effect of uncertainty on vote choice in the heteroskedastic probit formulation, it is much easier to do it in the homoskedastic probit formulation. As Achen argues that those two specifications are almost identical, I test the expectation about the effect of uncertainty on voters' choices in the standard probit model using equation 14 displayed in the previous section.

Table 6.1 presents the results of the homoskedastic probit analysis that considers uncertainty - information and political activism - to be independent variables directly affecting vote choice.

Table 6.1. Probit Analysis of Vote Choice of the NES Respondents, 1992-2004
Linear Specification of Activism and Information

Independent Variable	Year			
	1992	1996	2000	2004
Intercept	-1.935*** (0.291)	-1.603*** (0.218)	-2.314*** (0.321)	-1.094** (0.412)
Spatial Proximity	-0.169*** (0.029)	-0.185*** (0.030)	-0.136*** (0.033)	-0.173*** (0.038)
Partisanship	0.384*** (0.050)	0.369*** (0.047)	0.455*** (0.060)	0.448*** (0.074)
Candidate Leadership	0.646*** (0.095)	0.582*** (0.093)	0.800*** (0.115)	0.709*** (0.122)
Activism	0.078 (0.072)	0.034 (0.081)	0.090 (0.106)	-0.189* (0.115)
Information	0.039 (0.232)	-0. 092 (0.223)	0.257 (0.271)	-0.990** (0.363)
N	626	568	518	480
Log Likelihood	-126.980	-125.532	-88.239	-68.170
LR Test: χ^2	588.33***	536.32***	540.32***	527.21***

Dependent Variable: Vote Choice (0: Democratic Candidate; 1: Republican Candidate)
Standard errors are in parentheses.
*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

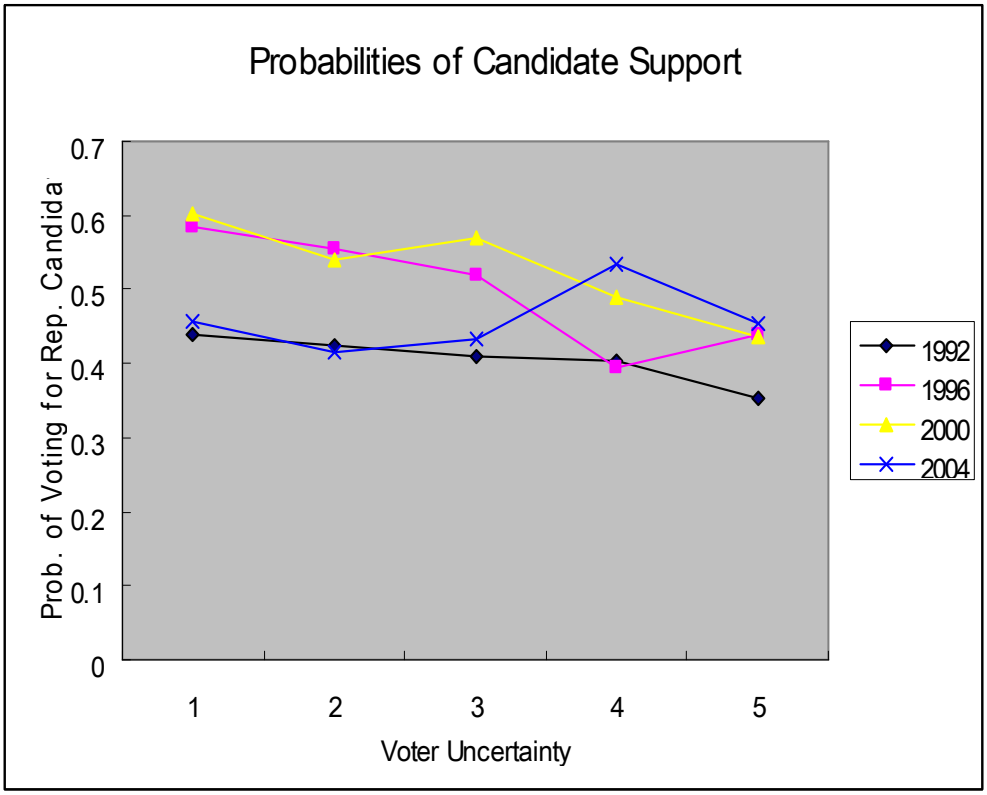
Based on the specification of the extended model employed in Chapter 5, this probit model is specified by issue proximity, partisanship and candidate leadership in addition to information and political activism representing voter uncertainty[25]. The results correspond well to the expectation proposed by the model that I suggest above, although the effects of information and activism on vote choice appear to be statistically significant only in 2004. Except for the effects of both information and activism in 1992 and that of information in 1996, the signs are mostly as were expected. This means that, if statistically significant, information and activism are negatively related to the probability of voting for the incumbent president or the vice president; that is, a lack of information and activism tends to increase the probability of voting for the incumbent. As uncertainty is a negative function of information and activism, this result implies that the more uncertain the voters were about the candidates, the more likely they were to vote for the incumbent, all other things held constant. Because uncertainty

[25] The reduced models — which are specified by issue proximity only or by proximity and partisanship — produce results quite similar to those exhibited in Table 6.1 (See Appendix to Chapter 6).

about the candidates is assumed to result more from uncertainty about the challenger than from uncertainty about the incumbent, this result also confirms the expectation that, the more uncertain a voter is about the challenger, the more likely the voter is to support the incumbent.

Among the exceptions, the positive effect of uncertainty on voting for the challenger in 1992 is worth noting. As mentioned earlier, this study excludes Perot voters who occupied around 20% of all voters, which may produce some distortion in the results. However, a more reasonable interpretation for the uncertain voters' tendency to support the challenger rather than the incumbent in 1992 may be that, as discussed in an earlier chapter, Clinton's strategic issue about Bush's failure to manage the economy motivated voters who were less informed about the campaign to vote for Clinton. As Sniderman et al. (1991) highlight, uninformed voters tend to make their vote decision depending on the incumbent's performance regarding national economic conditions.

Figure 6.1. Probabilities of Candidate Support by Uncertainty



These results are confirmed in a continuum with a graphical description. Figure 6.1 illustrates the effect of a voter's level of uncertainty on the probability that the voter would support Republican presidential candidates. In this graph, the voter's uncertainty about candidate preference, which is predicted by the heteroskedastic probit analysis, is graphed along the x-axis, and the probability of

voting for Republican candidates is graphed on the y-axis. To present a clear tendency of the relationship between uncertainty and vote choice, I rank voters' uncertainty on a five-point scale and calculate the mean probabilities of the voters on each uncertainty scale.[26] Although not monotonic, the relationship between uncertainty and the probabilities of candidate support generally corresponds to expectations. As voter uncertainty increases, voters are more likely to support candidates who are better known. Except for 1992, uncertain voters tended to vote for the incumbent president or vice president.

This tendency of uncertain voters to support for the better-known candidates is more clearly detected in a more simplified comparison between certain and uncertain voters. For this comparison, I dichotomize the voters by their levels of uncertainty predicted by the heteroskedastic probit estimation. Table 6.2 exhibits the probabilities that each of the two groups of voters will vote

[26] To validate the finding, the same graphical method with the ten-point scale uncertainty is presented in the appendix to this chapter. Although the degree of fluctuation of the mean probabilities of each scale is not identical, the tendency of the relationship between uncertainty and candidate support does not appear to be significantly different in both graphs.

for the Republican candidate. The results show that the uncertain voters and the certain voters are systematically different in their choices. Although the difference in the probability between certain and uncertain voters does not appear to be statistically significant in 2004, the magnitudes of the probabilities maintain the tendency of uncertain voters' support for the better-known candidate or the incumbent.

Table 6.2. Probabilities of Support for Republican Candidates by Uncertainty

Year	Certain Voters	Uncertain Voters
1992	.441 (.456)	.371* (.388)
1996	.573 (.457)	.423*** (.387)
2000	.566 (.462)	.493^{+} (.427)
2004	.435 (.483)	.492 (.421)

Standard deviations are in parentheses.

Test of mean difference between certain voters and uncertain voters

*** p<0.001; ** p<0.01; * p<0.05; + p<0.1; two-tailed tests.

These empirical results support the assertion that the more uncertain a voter is about the candidates' positions, the more likely the voter is to vote for the incumbent or the better-known candidate, all other things held constant. Again, voter uncertainty about candidates is more likely to come from their uncertainty about the challenger's positions than from their uncertainty about the incumbent's positions. Therefore, uncertain voters' tendency to support the incumbent reflects their tendency to avoid voting for the more uncertain candidate, as long as other considerations about the candidates do not significantly affect their vote choices.

6.3. Discussion

This chapter has examined the political significance of heterogeneity in voter uncertainty. In the first section, I discussed the models of voter uncertainty implying voters' risk-averse attitudes that prompt them to avoid voting for the candidate with more uncertainty associated with his policy positions when policy considerations do not differentiate the candidates. Achen's formulation shows that the heteroskedastic probit model adopted in this study also reflects the assumption

of risk aversion. Simply added to the components of candidate evaluation in the probit model, uncertainty is considered to have a direct, negative effect on vote choice. Deriving from Enelow and Hinich, Bartels, and Achen, I propose a model clearly reflecting the assumption of risk aversion. In this model, I suggest that the more uncertain a voter is about the challenger, the more likely he or she is to vote for the incumbent.

Section 2 of this chapter shows that this theoretical suggestion is supported by the NES data. The results of the homoskedastic probit model (Table 6.1), which is transformed from heteroskedastic probit, are the same as the results derived from the heteroskedastic probit model estimation (Table 6.2 and Figure 6.1) in terms of the implication, although the homoskedastic probit estimations for information and activism lack statistical significances in most years.

One possible reason for the insignificance of the estimation of the homoskedastic probit model could be that uncertainty may not directly affect vote choice in the way that Achen or other quadratic utility models propose—as an additively separable factor. Rather, as many empirical researchers have suggested

with respect to information effects, uncertainty may affect voting decision in a more indirect way by conditioning the effect of various considerations determining electoral choice. That is, certain voters and uncertain voters may differ in the degree to which they depend on specific voting cues, and this disparity may make voting outcomes different between certain and uncertain voters. As the empirical evidence in this chapter demonstrates that heterogeneous uncertainty has a significant bearing on campaign outcomes, further studies are expected to address the way this uncertainty affects those outcomes in more depth.

In this chapter, I have discovered that heterogeneity in uncertainty clearly matters for electoral outcomes. This finding has important implications for presidential campaigns. First, as uncertain voters avoid choosing less well-known candidates, the strategy of ambiguity in an attempt to make voters ambiguous about the candidate may not be as effective as has been anticipated. With the significant effect of uncertainty on vote choice, challengers are likely to have considerable disadvantages from voters' relatively greater uncertainty about

challengers. Challengers always have double tasks. As Franklin (1991) suggests, because challengers' emphasis on issues when attacking incumbents increases the variance in perceptions of the incumbent, while challengers have to inform voters about themselves, they also have to depend relatively more on attacking to decrease the clarity of voter perceptions of incumbents. In this vein, uncertainty is a critical source of the uphill task that challengers face.

Because the impact of uncertainty depends on disparities among candidates in the level of voter uncertainty (Bartels 1986: 725), it is important for the challenger to minimize the gap between voter uncertainty about the incumbent and uncertainty about the challenger. In particular, as shown in Chapter 4, the disparity between the incumbent and the challenger is much more considerable among uninformed and inactive voters than among informed and active voters; thus, it is of critical importance for challengers to make themselves known to uninformed and inactive voters.

In relation to this, the findings confirm the need for campaign tactics to be separately applied to uncertain and certain voters. As uncertain voters tend to

focus on the incumbent, while certain voters are likely to depend on a comparison of the policy positions of both candidates, the tactics or messages to inform voters about the challenger's policy positions may be less effective for uncertain voters than for certain voters. As suggested by Franklin (1991)'s empirical finding and Harrington, Jr. and Hess (1996)'s formal modeling on campaigning, the challenger who is less attractive to uncertain voters would do better to run a relatively more negative campaign. However, focusing on attacking opponents rather than informing voters about their policy positions may not be an efficient way to appeal to certain voters who want to compare the positions of candidates. As argued in Chapter 5, it is critical for campaigns to know which sector of the electorate is more (un)certain than other sectors in order to apply differentiated campaigning to certain and uncertain voters.

CHAPTER 7

Conclusion

This dissertation has examined heterogeneity in voter uncertainty among those voting in the U.S. presidential elections from 1992 to 2004. Using heteroskedastic probit models that include a component explaining uncertainty concerning vote choice, the study has discovered that, in contrast to the usual assumption of the spatial theory, voter uncertainty is not randomly distributed across individuals, but varies with the levels of information and political activism. Each empirical chapter of this dissertation provides insights into how critical it is for spatial voting models to account for heterogeneity in voter uncertainty.

7.1. Summary of Results

In Chapter 4, I demonstrate that more informed and more active American voters in 1992-2004 differed significantly from their less informed and less active peers in terms of issue conceptualization, variations in their perceptions of

candidates and "correctness" of their vote choices. More informed and more active voters were better able than less active and less informed voters to conceptualize their concerns about the campaign issues and, as a consequence, had more ideologically aligned opinions. In addition, more informed and more active voters were more certain of candidates' policy positions, and their perceptions of candidates varied less, than their less informed and less active peers. I have argued that these inconsistencies between the more informed/active and the less informed/active indicate heterogeneity in uncertainty about voting preferences. A simple comparison reveals that more informed and more active voters were more likely to make "correct" decisions, namely, certain choices. All these results suggest a voting model that addresses the uncertainty that is heterogeneous across voters.

In Chapter 5, the results of the heteroskedastic probit analysis disclose that voter uncertainty concerning their candidate preferences in the 1992-2004 U.S. presidential elections was caused by the voters' low levels of candidate information and political activism. Additional information cues hardly removed

the effects of information and activism on the uncertainty about vote choice, even if those cues did reduce those effects to some extent.

This chapter also shows that voters are predisposed to be more or less certain about their preferences. American voters in the 1992-2004 presidential elections who had ample resources (especially educational resources), who identified strongly with the parties, who used the media frequently and who were well connected socially, were better able to make certain choices than were other voters.

As information heterogeneity causes voter uncertainty to be heterogeneous across individulas, Chapter 6 explores the electoral consequences of this heterogeneous uncertainty. The theoretical and empirical analyses to explore the effect of uncertainty produce consistent results. A model derived from the models of Enelow and Hinich, Bartels, and Achen suggests that uncertain voters are likely to vote for the incumbent. This is because voter uncertainty comes more from uncertainty about the challenger's positions than from uncertainty about the incumbent's positions. This theoretical suggestion is supported by the data from

1996 through 2004. The empirical evidence clearly shows that, as voter uncertainty increases, voters are more likely to support the candidates who are better known or the incumbent. This disparity between certain voters and uncertain voters in vote choice suggests campaign strategies and tactics varying across voters as well as across candidates.

7.2. Implications and Contributions

This dissertation reveals that voter uncertainty is a function of information about candidates and political activism. Although this finding is not surprising or unexpected, it has important implications for spatial analysis and studies of public opinion. First of all, the findings of this dissertation challenge the basic assumption of spatial voting theory that uncertainty - the error - in vote choice is a random variable following a normal distribution. Although spatial theorists acknowledge that some voters have more limited information than others, they do not presume that this limitation in information leads those less informed voters to be less certain than others; they often claim that voters' low levels of information

are not a significant problem because uninformed voters can infer informed preferences from various information cues. This view runs counter to Downs, who significantly considered voter heterogeneity on the uncertainty scale. This dissertation succeeds in providing empirical evidence of information heterogeneity in the framework of the spatial theory of voting and thus revives Downs' argument of heterogeneity in voter uncertainty.

By incorporating information heterogeneity, which studies of political information have paid attention to, into the spatial voting model, this dissertation unifies two different scholarly traditions. Methodologically, the heteroskedastic probit analysis makes this unification possible. Deviating from the conventional method of spatial voting, which simply assumes constant variance, this method directly detects heteroskedasticity of voting choice and, at the same time, estimates the factors that explain the heteroskedasticity. Therefore, this dissertation challenges the conventional spatial analysis of voting both theoretically and methodologically, and its empirical findings legitimize this challenge.

Next, the findings of this dissertation have important implications from strategic politicians' perspectives. A question arising from the empirical results of this study can be, "What are the candidates' strategies toward voters who are heterogeneous in their level of uncertainty?" As I have discussed, Aldrich and Schofield and his colleagues show that candidates' strategic positions are not convergent because of the discrepancy between active and inactive voters. Similarly, I notice, heterogeneous voter uncertainty is likely to make it difficult for candidates'/parties' strategic positions to converge toward the center. Spatial analysts normally presume that, the closer the candidates' or parties' positions are to the ideal points of the voters located at the center of the issue space, the more likely it is that they can win elections (Enelow and Hinich 1984-b; Hinich 1977; McKelvey and Ordeshook 1982, 1990).

However, the results of this study raise a more complex optimization problem vis-à-vis certain and uncertain voters. Given that certain and uncertain voters differ in their perceptions and attitudes, as well as in their characteristics, the vote-maximizing candidates seeking positions that satisfy as many voters as

possible should balance those certain and uncertain voters' needs and incentives. Nevertheless, because they are not identically informed about candidates, are not equally active and differ in their responsiveness to candidates'/parties' strategies, certain and uncertain voters may not carry equal weight with the candidates. Because active and informed voters are more likely to make contributions that can be used to enhance the candidates' valences (Schofield and Sened 2005: 360), and are more likely to respond to the candidates in the way that the candidates hope the voters will, certain voters tend to lead candidates to be positioned around their ideal points. Therefore, the positions where the incentives of the uncertain and certain voters are balanced are not likely to be at the center of the entire voters.

The data employed in this study disclose that candidates differ in their positional strategies toward heterogeneous groups of voters. The positions of the Republican candidates in 1992-2004 were steadily closer to their certain voters, whereas the Democratic candidates appeared to consider their certain and uncertain voters to similar degrees. These results suggest that voter uncertainty, or information and activism, is an important element that leads candidates to be

adaptive, that is, to move toward stronger positions in the issue space. Differently from the conventional assumption in the spatial analysis, however, those parties' or candidates' strategic positions do not seem to simply coincide with the electoral center. Their certain voters, who attach to the issues more strongly than the uncertain voters do, may not allow globally appealing positions.

In addition to the equilibrium strategy, the empirical results of this study also suggest what campaign tactics toward heterogeneous voters should be like. The findings that certain and uncertain voters have different characteristics and voting behavior propose distinguished campaign tactics and cues for those voters. Because studies have found that voters with different levels of information rely on different voting cues and are swayed by different tactical approaches, certain and uncertain voters are expected to respond to specific campaign cues or tactics to different degrees. Certain cues or campaign tactics that are effective for certain voters may not be useful for uncertain voters. For example, as uncertain voters tend to focus only on the incumbent's performance rather than comparing the policy positions of the two candidates, for uncertain voters, the tactics or

messages to inform voters about the challenger's policy positions may be less effective than attacking the incumbent's performance. On the other hand, because certain voters are likely to depend on a comparison of the policy positions of both candidates, it is critical for challengers to make certain voters know their policy positions. In this vein, this study warns against campaign strategies and tactics that are uniformly applied to all voters without considering the voters' different levels of information and activism.

Finally, the findings of this study make it possible to reach a normative account of the relationship between information and the soundness of democracy. Given that more informed and active voters' opinions differ significantly from those of their less informed and less active peers, public opinion scholars have shown that a lack of information and its asymmetries have a crucial bearing on electoral outcomes, and that they distort the representation mechanism. Because the more informed and active, being certain about their preferences, are better able to evaluate candidates based on their issue positions, or to judge the

appropriateness of those candidates as political leaders, and because they are better able to pull the candidates toward more ideologically extreme positions, information, activism and certainty are an important element of the citizenly ideal for a sound democracy. Also, from the strategic candidate perspective, voters' levels of information are a critical element. As uncertainty, or a lack of information, decreases the probability of voting for the candidate, the findings suggest that providing the voters with as much information about the candidate's positions as possible is a more effective strategy than strategically circulating ambiguous information.

7.3. Suggestions for Future Research

This dissertation claims that variations in voter uncertainty should be an important concern in the analysis of spatial voting. It is important for future research to reject the assumption of fully informed and optimizing voters, and to incorporate voter heterogeneity in voting models in order for theory to correspond

with empirical observations. The heteroskedastic probit model employed in this study is a nice example that incorporates voter heterogeneity.

The model, however, contains purely electoral effects; but can possibly be improved to grasp dynamic interactions between heterogeneous voters and candidates/parties. Miller and Schofield (2003), Schofield (2003) and Schofield and Sened (2005) hint at a direction for this improvement. As I discussed in Chapter 2, these scholars propose a model that determines a voter's utility for a party by activist-generated valence which is a function of the party's strategic position, as well as the proximity between the voter and the party, and a stochastic error characterizing the party's exogenously determined popularity valence. Simply, the model implies that, when a voter is uncertain about the party's issue positions, the voter may vote according to either the party's popularity or activist-generated valence. Because activist-generated valence results from the party's policy response to activists' demands, uncertain voters' utilities are now also associated with candidates' policy strategies, although they lack information about the candidates' positions.

However, despite their interest in heterogeneity between average voters and activists, Schofield and his associates do not consider voters to be heterogeneously uncertain by assuming that valence terms are either randomly distributed (popularity valence) or constant in each election although varying across elections (activist valence). For them, uncertainty is homogeneously high or low for all voters. Given the observation that voter uncertainty is an almost inherent characteristic of the electorate in democratic societies, the voting model in future research may enhance its predictive power by incorporating not only voter uncertainty affected by voters' personal resources such as information and activism but also the interaction between the heterogeneous voters and candidates, which lead the candidates to be strategically adaptive.

As a matter of fact, substantial party or candidate differences persistently observed in the U.S. have weakened the robustness of the theory of spatial voting predicting policy convergence. To explain this contradiction between the theory and the empirical observations, some spatial analysts assume that candidates are incompletely informed about voter preferences (Calvert 1985; Morton 1993).

They show that candidates' incomplete information causes platform divergence. This dissertation does not take the incompleteness of candidates' information into considerations but simply assumes that candidates are perfect optimizers having complete information. However, if candidates are informed imperfectly and thus incorrectly about the preferences of certain and uncertain voters, their strategies may be different than when they are perfectly informed. Future research for the spatial voting model may provide insights into how voter uncertainty and its heterogeneity interact with the candidates incompletely informed about voter preferences and how this interaction accounts for the nature of electoral competition.

Finally, the questions of this dissertation can be explored in other electoral contexts from a comparative perspective to improve our understanding of information and its impact on spatial voting. I expect that heterogeneous voter uncertainty is a common phenomenon witnessed in various electoral contexts. Electoral context, however, is also expected to play a critical role in determining the level of heterogeneity in voter uncertainty and its electoral effects. Scholars

have revealed that the effect of information or uncertainty varies between high-information and low-information campaigns. They have also found that the effect of information heterogeneity in another county (Lin 2005). Any normative resolution or claim by ignoring different electoral contexts will be unrealistic. Future studies are expected to accumulate more knowledge about various electoral contexts with respect to heterogeneity in uncertainty and its political significance.

APPENDICES

Appendix to Chapter 3

Variables Included in the Heteroskedastic Probit Analysis

* ***Dependent Variable***: Vote Choice

Who did you vote for?

0. Democratic candidate

1. Republican candidate

* ***Partisanship***

Generally speaking, do you think of yourself as a Republican, a Democrat, an Independent, or what? Would you call yourself a strong Democrat/Republican or a not very strong Democrat/ Republican? Do you think of yourself as closer to the Republican Party or to the Democratic Party?

1. Strong Democrat

2. Weak Democrat

3. Independent-Democrat

4. Independent-Independent

5. Independent-Republican

6. Weak Republican

7. Strong Republican

* ***Candidate Leadership*** = Value of Republican candidate's leadership

– Value of Democratic candidate's leadership

Think about candidate (name). In your opinion, does the phrase 'he is strong leader' describe candidate (name) extremely well, quite well, not too well, or not well at all?

1: Not well at all

2: Not too well

3: Quite well

4: Extremely well

* ***Issue Proximity***

Spending and Services

Some people think the government should provide fewer services, even in areas such as health and education in order to reduce spending. Other people feel it is important for the government to provide many more services even if it means an increase in spending.

Where would you place yourself (candidate j or party p) on this scale?

1: Gov't provide many more services, increase spending a lot

2:

3:

4:

5:

6:

7: Gov't provide many fewer services, reduce spending a lot

Defense Spending

Some people believe that we should spend much less money for defense.

Others feel that defense spending should be greatly increased.

Where would you place yourself (candidate j or party p) on this scale?

1: Greatly decrease defense spending

2:

3:

4:

5:

6:

7: Greatly increase defense spending

Jobs and Standard of Living

Some people feel the government in Washington should see to it that every person has a job and a good standard of living. Others think the government should just let each person get ahead on their own.

Where would you place yourself (candidate j or party p) on this scale?

1: Gov't see to job and good standard of living

2:

3:

4:

5:

6:

7: Gov't let each person get ahead

Jobs vs. Environment

Some people think it is important to protect the environment even if it costs some jobs or otherwise reduces our standard of living. Other people think that protecting the environment is not as important as maintaining jobs and our standard of living.

Where would you place yourself (candidate j or party p) on this scale?

1: Protect environment, even if it costs jobs, standard of living

2:

3:

4:

5:

6:

7: Jobs, standard of living more important than environment

Interventionism by Diplomacy or Military Action

Some people believe the United States should solve international problems by using diplomacy and other forms of international pressure and use military force only if absolutely necessary. Others believe diplomacy and pressure often fail and the U.S. must be ready to use military force. Where would you place yourself (candidate j or party p) on this scale?

1: Should solve with diplomacy

2:

3:

4:

5:

6:

7: Must be ready to use military force

**** Items for Activism*** (1: Yes, 0: No)

1) We would like to find out about some of the things people do to help a party or a candidate win an election. During the campaign, did you talk to any people and try to show them why they should vote for or against one of the parties or candidates?
2) Did you wear a campaign button, put a campaign sticker on your car, or place a sign in your window or in front of your house?
3) Did you go to any political meetings, rallies, speeches, dinners, or things like that in support of a particular candidate?
4) Did you do any (other) work for one of the parties or candidates?
5) During an election year people are often asked to make a contribution to support campaigns. Did you give money to an individual candidate running for public office?
6) Did you give money to a political party during this election year?
7) Did you give any money to any other group that supported or opposed candidates?

Appendix to Chapter 4

Table 4.5-A1. Ideal Points by Information and Activism, 1992

Issues	Information Level		Activity Level	
	Low	High	No Activity	One or More
Spending & Services	-.047 (.886)	.115* (.816)	-.059 (.836)	.093* (.863)
Job & Standard of Living	-.065 (.988)	.094* (.886)	-.098 (1.004)	.084* (.893)
Defense Spending	-.285 (.932)	-.351 (.834)	-.324 (.898)	-.314 (.876)
N	332	332	255	409

Standard deviations are in parentheses.

Difference of means tests: *** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

Table 4.5-A2. Ideal Points by Information and Activism, 1996

Issues	Information Level		Activity Level	
	Low	High	No Activity	One or More
Spending & Services	.134 (.822)	.139 (.765)	.079 (.698)	.186 (.865)
Job & Standard of Living	-.066 (1.025)	.287** (.847)	-.237 (.967)	-.123 (.927)
Defense Spending	.024 (.879)	-.266*** (1.007)	-.167 (.962)	-.079 (.948)
N	288	284	264	308

Standard deviations are in parentheses.

Difference of means tests: *** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

Table 4.5-A3. Ideal Points by Information and Activism, 2000

Issues	Information Level		Activity Level	
	Low	High	No Activity	One or More
Spending & Services	-.029 (.927)	.203** (.834)	.111 (.980)	.070 (.817)
Job & Standard of Living	.135 (.850)	.280 (.984)	.230 (.760)	.192* (1.023)
Defense Spending	-.140 (1.436)	-.068 (1.365)	-.008 (1.473)	-.172 (1.343)
N	271	272	226	317

Standard deviations are in parentheses.

Difference of means tests: *** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

Table 4.5-A4. Ideal Points by Information and Activism, 2004

Issues	Information Level		Activity Level	
	Low	High	No Activity	One or More
Spending & Services	.074 (1.868)	.060 (.845)	.014 (.841)	.089 (1.634)
Job & Standard of Living	-.108 (2.118)	.051 (.851)	-.028 (.941)	-.028 (1.822)
Defense Spending	-.283 (.772)	-.263 (.746)	-.290 (.757)	-.266 (.760)
N	247	247	144	350

Standard deviations are in parentheses.

Difference of means tests: *** p<0.001; ** p<0.01; * p<0.05; two-tailed tests.

Table 4.7-A1. Estimated Candidate Issue Positions by Information and Activism, 1992

Issues	Candidates	Information Level		Activity Level	
		Low	High	No Activity	One or More
Spending & Services	Clinton	-.481 (.297)	-.481 (.194)***	-.487 (.253)	-.477 (.224)***
	Bush	.492 (.301)	.495 (.193)***	.499 (.265)	.491 (.217)***
Job & Standard of Living	Clinton	-.490 (.326)	-.503 (.191)***	-.487 (.253)	-.477 (.224)**
	Bush	.496 (.316)	.488 (.185)***	.499 (.265)	.491 (.218)***
Defense Spending	Clinton	-.499 (.283)	-.483 (.200)***	-.489 (.262)	-.488 (.213)***
	Bush	.508 (.295)	.509 (.186)***	.512 (.256)	.506 (.215)***

Standard deviations are in parentheses.

F-ratio tests: *** $p<0.001$; ** $p<0.01$; * $p<0.05$

Table 4.7-A2. Estimated Candidate Issue Positions by Information and Activism, 1996

Issues	Candidates	Information Level		Activity Level	
		Low	High	No Activity	One or More
Spending & Services	Clinton	-.490 (.286)	-.486 (.231)***	-.481 (.283)	-.492 (.214)***
	Dole	.488 (.295)	.489 (.231)***	.485 (.293)	.495 (.209)***
Job vs. Environment	Clinton	-.546 (.396)	-.498 (.244)***	-.530 (.339)	-.497 (.269)
	Dole	.460 (.402)	.471 (.243)***	.464 (.340)	.471 (.272)***
Defense Spending	Clinton	-.526 (.369)	-.494 (.268)***	-.502 (.321)	-.505 (.286)**
	Dole	.467 (.383)	.495 (.258)***	.482 (.324)	.491 (.287)**

Standard deviations are in parentheses.

F-ratio tests: *** $p<0.001$; ** $p<0.01$; * $p<0.05$

Table 4.7-A3. Estimated Candidate Issue Positions by Information and Activism, 2000

Issues	Candidates	Information Level		Activity Level	
		Low	High	No Activity	One or More
Spending & Services	Gore	-.480 (.336)	-.498 (.230)***	-.491 (.290)	-.495 (.255)**
	Bush	.461 (.355)	.489 (.242)***	.471 (.309)	.491 (.266)***
Job & Standard of Living	Gore	-.470 (.393)	-.483 (.202)***	-.463 (.301)	-.493 (.272)*
	Bush	.478 (.380)	.499 (.193)***	.481 (.293)	.503 (.263)**
Defense Spending	Gore	-.473 (.407)	-.482 (.227)***	-.474 (.341)	-.486 (.280)***
	Bush	.486 (.395)	.518 (.211)***	.500 (.346)	.517 (.257)***

Standard deviations are in parentheses.

F-ratio tests: *** $p<0.001$; ** $p<0.01$; * $p<0.05$

Table 4.7-A4. Estimated Candidate Issue Positions by Information and Activism, 2004

Issues	Candidates	Information Level		Activity Level	
		Low	High	No Activity	One or More
Spending & Services	Kerry	-.500 (.180)	-.501 (.183)	-.501 (.200)	-.500 (.172)***
	Bush	.494 (.316)	.509 (.251)***	.519 (.297)	.497 (.268)*
Job & Standard of Living	Kerry	-.484 (.313)	-.520 (.274)**	-.527 (.321)	-.497 (.276)***
	Bush	.519 (.322)	.527 (.268)***	.538 (.294)	.518 (.287)
Interventionism	Kerry	-.539 (.283)	-.544 (.229)***	-.550 (.287)	-.538 (.226)***
	Bush	.609 (.230)	.575 (.213)	.589 (.262)	.587 (.187)***

Standard deviations are in parentheses.

F-ratio tests: *** p<0.001; ** p<0.01; * p<0.05

Table 4.8-A. Uncertainty on Positions of Clinton by Information and Activism (%), 1996

Issues	Scale	Information Level		Activity Level	
		Low	High	No Activity	One or More
Spending & Services	Very certain	32.29	36.27	27.27	40.26
	Pretty certain	54.17	53.87	56.82	51.62
	Not very certain	13.54	9.86	15.91	8.12
Job vs. Environment	Very certain	23.96	23.59	20.08	26.95
	Pretty certain	51.04	59.15	56.06	54.22
	Not very certain	25.00	17.25	23.86	18.83
Defense Spending	Very certain	27.08	20.77	17.05	29.87
	Pretty certain	52.43	57.39	60.23	50.32
	Not very certain	20.49	21.83	22.73	19.81

Table 4.9-A. Uncertainty on Positions of Dole by Information and Activism (%), 1996

Issues	Scale	Information Level		Activity Level	
		Low	High	No Activity	One or More
Spending & Services	Very certain	23.61	28.52	24.24	27.60
	Pretty certain	55.56	61.27	54.55	61.69
	Not very certain	20.83	10.21	21.21	10.71
Job vs. Environment	Very certain	14.93	13.73	11.74	16.56
	Pretty certain	50.69	61.97	55.68	56.82
	Not very certain	34.38	24.30	32.58	26.62
Defense Spending	Very certain	20.56	22.18	16.35	25.65
	Pretty certain	51.57	60.21	54.75	56.82
	Not very certain	27.87	17.61	28.90	17.53

Appendix to Chapter 5

Variables Included in the OLS Regression Analysis

**** Income***

I am going to read you a list of all income categories.

Please tell me which category best describes the total income you had in 1999 before taxes. This figure should include salaries, wages, pensions, dividends, interest, and all other income. Please stop me when I get to your income category. (This variable combines data for respondents from households with other members age 14 and older and data for respondents who are the only member age 14 and older.)

1. A. NONE OR LESS THAN $4,999

……

22. Y. $200,000 and over

**** Education***

What is the highest grade of school or year of college you have completed? Did you get a high school diploma or pass a high school equivalency test? What is the highest degree that you have earned?

1. 8 grades or less and no diploma or equivalency

……..

7. Advanced degree, including LLB

* ***Partisan Strength***: recoded from the partisanship variable

(See Appendix to Chapter 3)

1: Independent-Independent

2: Independent-Democrat + Independent-Republican

3: Weak Democrat + Weak Republican

4: Strong Republican + Strong Democrat

* ***Age***

What is the month, day and year of your birth?

Age was calculated by subtracting the year of birth from 2000. For cases where R refused to give year of birth or year of birth was NA in the survey variable, a check was made of Household listing information: if age of R was included in the Household listing, it was included here from the Household listing.

* ***Hispanic and Black***

What racial or ethnic group or groups best describes you?

* ***Northeast and South***

Census region - interview location

* ***Rural***

Census size of place - interview location

* ***TV News***

How many days in the past week did you watch the national network news on TV?

0. None
1. One day
2. Two days
3. Three days
4. Four days
5. Five days
6. Six days
7. Every day

* ***Newspaper***

How many days in the past week did you read a daily newspaper?

0. None

1. One day

2. Two days

3. Three days

4. Four days

5. Five days

6. Six days

7. Every day

* ***Organizational Affiliation***

Here is a list of some organizations people can belong to. There are labor unions, associations of people who do the same kinds of work, fraternal groups such as Lions or Kinterviewanis, hobby clubs or sports teams, groups working on political issues, community groups, and school groups. Of course, there are lots of other types of organizations, too. Not counting membership in a local church or synagogue, are you a member of any of these kinds of organizations?

1. Yes

0. No

* ***Executive/Professional***

What is/was your main occupation? What sort of work do/did you do?

What are/were your most important activities or duties?

1. Executive, Administrative and Managerial,

   Professional Specialty Occupations

0. Other occupations

* ***Laborer***

What is/was your main occupation? What sort of work do/did you do?

What are/were your most important activities or duties?

1. Machine Operators, Assemblers and Inspectors,

   Transportation and Material Moving Occupations,

   Handlers, Equipment Cleaners, Helpers and Laborers

0. Other occupations

* ***Female***

R's sex is:

0. Male

1. Female

Appendix to Chapter 6

Table 6.1-A1. Probit Analysis of Vote Choice of the NES Respondents, 1992-2004 (Proximity Model)

Independent Variable	Year			
	1992	1996	2000	2004
Intercept	-0.165 (0.141)	-0.383*** (0.218)	-0.377** (0.143)	0.944** (0.225)
Spatial Proximity	-0.339*** (0.021)	-0.347*** (0.024)	-0.303*** (0.022)	-0.367*** (0.026)
Activism	0.075 (0.052)	0.084 (0.059)	0.086 (0.062)	-0.155** (0.065)
Information	0.200 (0.174)	-0. 561 (0.166)	0.264 (0.182)	-0.751** (0.245)
N	664	572	542	494
Log Likelihood	-238.272	-218.686	-211.924	-161.036
LR Test: χ^2	416.73***	355.53***	326.28***	360.93***

Dependent Variable: Vote Choice (0: Democratic Candidate; 1: Republican Candidate)

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

Table 6.1-A2. Probit Analysis of Vote Choice of the NES Respondents, 1992-2004 (Proximity + Partisanship)

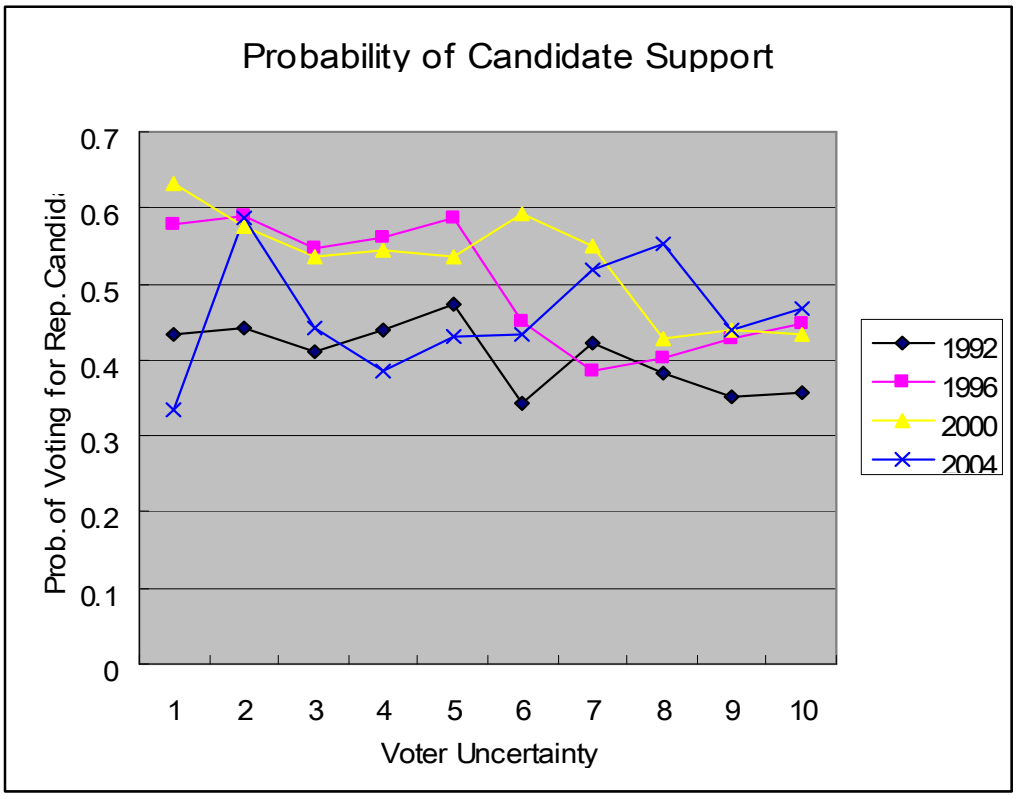
Independent Variable	Year			
	1992	1996	2000	2004
Intercept	-2.014*** (0.244)	-1.872*** (0.196)	-2.313*** (0.248)	-1.441** (0.348)
Spatial Proximity	-0.199*** (0.025)	-0.211*** (0.028)	-0.176*** (0.027)	-0.230*** (0.033)
Partisanship	0.460*** (0.043)	0.455*** (0.042)	0.537*** (0.048)	0.583*** (0.061)
Activism	0.072 (0.061)	0.020 (0.072)	0.077 (0.085)	-0.161* (0.091)
Information	-0.176 (0.203)	0. 023 (0.199)	0.060 (0.223)	-0.859** (0.302)
N	663	572	539	491
Log Likelihood	-167.548	-149.546	-128.111	-95.810
LR Test: χ^2	557.16***	493.80***	489.83***	487.09***

Dependent Variable: Vote Choice (0: Democratic Candidate; 1: Republican Candidate)

Standard errors are in parentheses.

*** p<0.001; ** p<0.01; * p<0.05; one-tailed tests.

Figure 6.1-A. Probabilities of Candidate Support by Uncertainty (10-point Scale)



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